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THE

TRANSACTIONS

OF THE

AMERICAN

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J. A. Foster

CONTENTS.

PAGE

MINUTES OF THE SIXTEENTH ANNUAL MEETING OF THE AMERICAN MEDICAL ASSOCIATION 9

Report of the Committee of Publication 61

Report of the Treasurer 65

Address of N. S. DAVIS, M. D., President of the Association . . . 69

Report of the Section on Practical Medicine and Obstetrics . . . 87

Report on the Use of the Sulphites of Lime and Soda in the Treatment of Hospital Gangrene, Phlebitis, Erysipelas, and other Zymotic Diseases. By A. FISHER, M. D. 93

The Causation, Course, and Treatment of Insanity in Women: a Gynæcist's idea thereof; being the Report of the Standing Committee on Insanity for 1864–65. By HORATIO ROBINSON STORER, M. D., of Boston, Surgeon to the New England Hospital for Women; Assistant in Obstetrics and Medical Jurisprudence in Harvard University, and Professor of Obstetrics and the Diseases of Women in Berkshire Medical College 121

Report of the Section of Medical Jurisprudence and Hygiene . . . 257

Report of the Committee on the Value and Necessity of Vaccination and Revaccination for the Eradication of Smallpox 263

Smallpox: its Pathology and Treatment. By ANDREW NEBINGER, M. D., of Philadelphia 279

A Paper on the Propriety and Necessity of Compulsory Vaccination. By J. M. TONER, M. D., Washington, D. C. 305

Report of the Committee on the Introduction of Disease by Commerce, and the Means for its Prevention. By A. N. BELL, M. D., Brooklyn, N. Y. . 331

Report of the Section on Surgery 345

Fissure of the Soft and Hard Palate. By J. MASON WARREN, M. D., Boston, Massachusetts 351

On the Mechanical Treatment of Chronic Inflammation of the Joints of the Lower Extremities, with a Description of some New Apparatus for Producing Extension at the Knee and Ankle-Joints. By LEWIS A. SAYRE, M. D., Surgeon, Bellevue Hospital; Professor of Orthopædic Surgery, Bellevue Hospital Medical College; Resident Physician of the City of New York; Member of the American Medical Association; N. Y. State Medical Society; N. Y. Academy of Medicine; N. Y. Pathological Society, etc. etc. . . 377

Case of Exsection of the Wrist-Joint. By S. H. TEWKSBURY, M. D., of Portland, Maine 403

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PAGE

On Dislocation of the Sternal End of the Clavicle, with a New Apparatus for Maintaining its Reduction. By H. D. Holton, M. D., of Putney, Vermont 409

Practical Observations in Ophthalmology. By E. Williams, M. D., of Cincinnati, Ohio 415

On Foreign Bodies in the Ear, with a Bibliography and a Condensed Statement of the Present Condition of Aural Surgery. By Laurence Turnbull, M. D., Aural Surgeon to Howard Hospital, etc., Philadelphia . . . 429

Remarks on the Experiments and Observations of Bell, Mayo, and others, on which the Doctrine of Sensitive and Motor Nerves was Chiefly Founded. By Benjamin Haskell, M. D., Rockport, Mass. 453

Report of the Section of Meteorology, Medical Topography, and Epidemic Diseases 463

Report in part upon the Climatology and Epidemic Diseases of Connecticut. By B. H. Catlin, M. D., Meriden, Conn. 467

Report on the Medical Topography and Epidemics of California. By Thomas M. Logan, M. D., of Sacramento, California 495

Report of the Committee Appointed to Memorialize Congress in regard to the Medical Department of the Army 571

Report of the Committee on the Rank of the Medical Officers of the Navy . 581

Report of the Committee on Medical Education 585

Report on American Medical Necrology. By Christopher C. Cox, M. D., of Maryland 607

Prize Essay.—On the Surgical Treatment of Morbid Growths within the Larynx. By Louis Elsberg, A. M., M. D., Lecturer on the Diseases of the Larynx and Throat in the University of New York, Fellow of the Academy of Medicine, Member of the New York County Medical Society, etc. etc. . 653

Prize Essay.—The Criminality and Physical Evils of Forced Abortions. Being the Prize Essay to which the American Medical Association awarded the Gold Medal for MDCCCLXV. By Horatio Robinson Storer, M. D., of Boston, Assistant in Obstetrics and Medical Jurisprudence in Harvard University, Surgeon to the New England Hospital for Women, and Professor of Obstetrics and the Diseases of Women in Berkshire Medical College . 709

Report of the Committee Appointed to Revise the Plan of Organization, etc. 747

Code of Ethics of the American Medical Association 763

List of the Ex-Presidents and Vice-Presidents 781

Officers and Permanent Members 786

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MINUTES

OF THE

SIXTEENTH ANNUAL MEETING

OF THE

AMERICAN MEDICAL ASSOCIATION,

Held in the City of Boston, June 6th, 7th, 8th, 9th, 1865.

THE Association assembled in the State House at 11 A.M., and was called to order by the President, N. S. DAVIS, M.D., of Illinois, supported by Vice-Presidents WORTHINGTON HOOKER, M.D., of Connecticut, and F. E. B. HEINTZE, of Maryland. The Permanent Secretary, WM. B. ATKINSON, M.D., of Pennsylvania, and the Assistant Secretary, H. R. STORER, M.D., of Massachusetts, were also present.

Rev. S. K. LOTHROP, D.D., of Brattle Square Church, was introduced, and opened the session with an impressive prayer.

The President having announced the Association as prepared for business, HENRY J. BIGELOW, M.D., Chairman of the Committee of Arrangements, welcomed the delegates in the following address:—

"*Mr. President and Gentlemen of the Association*—

"By direction and under the authority of the Committee of Arrangements, I bid you cordial welcome to the metropolis of New England. Sixteen years ago, these halls were honored by your distinguished presence; and since that time, although a bloody war has devastated the land, twice have you met together, under the sheltering protection of cities far distant from each other, to lay an offering upon the altar of science. We are now once again

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assembled to unite in a single common sentiment of congratulation at the advent of peace for which we have so long watched, and in whose genial sunshine the flowers of science may again expand.

"The American Medical Association was at no remote period one of the prosperous institutions of the country. From a small and perhaps doubtful beginning, it had risen by a continuous and steady growth to become one of the successful enterprises of the age. The great cities of the North hailed its advent with acclamation, while farther South the hospitable homes of Richmond and Charleston, of Nashville and St. Louis, were thrown open for its warm and generous reception.

"Such was our enviable position four years ago, when the demon of insurrectionary strife exhaled its poisonous and blasting breath over the fairest and most fertile portion of our common country. Cut off from intercourse with their Northern brethren, deprived of the opportunity of attaining light and truth, borne down by relentless exactions and unmerciful conscription, by devastating war and its inevitable sequels of poverty and bereavement, our Southern States have been to us for four years an alien and a hostile land.

"During this long and weary period, the steadfast edifice of the republic has breasted the battle and the storm; an insidious and fatal bolt at last descending to rive its highest pinnacle. We recover from the shock to thank God that, as the tumult ceases and the smoke clears away, the grand old edifice still lifts its head among the nations, unshaken in its foundation, untarnished in its glory, an impregnable tower of strength, and the hallowed shrine of patriotism. The Southern States have at last succumbed before the persevering valor and terrible unanimity of the North, and the jarring elements have at last found repose, after the convulsions of a great transition period, not in the replacement of the old strata, but by the gravitation of the social system into the final and inevitable equilibrium of human rights.

"While the whole country is occupied with the great and difficult problem of reconstructing the Union, that we may come out of this ordeal a wiser, a more stable, and a more prosperous people, it is for us to consider whether we cannot do something to render our own Association a more efficient and a more productive institution. No one can doubt that the medical science of this country, now ostensibly represented in this body, is destined one day to occupy a very high place in the medical history of the world. The American mind, the practical ability of which no one has ever doubted, is

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devoting itself more and more to the study, by exact experimental observation, of abstract truth, each year augmenting the number of medical philosophers devoted to scientific research at the sacrifice of professional and personal interest. It requires no prophet to foretell that they will identify this association with illustrious labors whose magnitude and importance will henceforth keep pace with the invigorated growth of the republic.

"And who shall set bound or limit to the vast future of this country? If we believe with the great philosopher that 'in the youth of a State, arms do flourish; in the middle age of a State, learning,' who that has witnessed the Titanic conflict between opposing hosts such as the history of the world has rarely seen confronted; who that contemplates the magnitude of this broad continent, its millions of acres of waving grain, the treasures buried in its bosom, the iron, the gold and silver, and coal and oil more precious than these; the great liquid highways that bind together North and South and East and West in one indissoluble bond of natural union; the energy of its people; the enormous territory now first thrown open to the intelligent efforts of free labor—who can fail to discern, in these combining elements of prosperity, the stalwart youth of a colossal nation? Let your imagination for a moment contemplate the vision of its maturity and manhood, when the great Western valley shall become a central home of letters and the arts; when the culminating light of science shall there shed its full effulgence, and the youthful giant of the Western hemisphere, in his ripened strength and intellect, shall challenge the place left vacant for him on our planet.

"While the great republic is accomplishing its political destiny, let us fail not to carry forward our corresponding mission of relieving human suffering, averting human disaster, and retarding human decay; not by deceptive assumptions, not by fallacious assurances, not by the dogmas which professional pride has set up, but by an earnest, impartial, and discriminating pursuit of truth, and by an unwearied effort to divorce popular error from the companionship of legitimate science. It is our duty to lay here, in solid labor, the foundations of an association which, for a century to come, shall gather to a focus and radiate the light emanating from the best minds in our profession.

"We rejoice to offer an earnest expression of our gratitude to those of our medical brethren, some of whom we are proud to see among us, who have stood so nobly at their posts by sea and land,

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amid the carnage and the pestilence; and who, surrounded by the distractions of the camp and of the fight, have borne a conspicuous part, both by their active services and their literary labors in upholding the honor and dignity of their profession.

"Not less happy are we to see among us, our brethren of those neighboring provinces, from which we have received such kindly tokens in our recent hour of national affliction. The people of this continent have so many common interests and common sympathies, that no political landmarks can render them alien to each other.

"I welcome you, gentlemen, in behalf of the Committee I have the honor to represent, of the old Massachusetts Medical Society, who cherishes a matronly regard towards her younger sisters of other States; in behalf of the City of Boston, which extends to you her civic hospitality. Welcome, friends and brothers! assembled from distant regions of our common land—from the great commercial emporium through whose aortic thoroughfare pours the ceaseless tide of nations, or from the city whose traditional brotherly love echoes so freshly from the lips of all our wounded soldiers; you, brothers of New England, born to the common heritage of toil and freedom; you, whose homes are by the great Western watercourses, whose blood sprang from the same fountain as our own, and has so often mingled with it again upon the battle-field; and you, few, we may fear, but thrice welcome, loyal and faithful brothers of the South, who have passed through the long night of trial that you might hail to-day the glorious dawn of liberty. Welcome, fellow-citizens of the redeemed republic, whose wounds you have bound up in binding up those of her defenders. Welcome all who honor us by their presence on this auspicious morning, which beholds the sacred emblem of liberty restored to its rightful places, tattered with bullets, stained with blood, fringed with the sable sign of mourning, but spread over every stronghold from which treason had struck it down, and soon to rekindle all its ancient glories."

The Permanent Secretary called the roll of members present.

The Committee of Arrangements reported the following as duly accredited delegates and permanent members, comprising a total of 616 members:—

CONNECTICUT.

Connecticut State Medical Society, { B. H. CATLIN, CHAS. L. IVES, JAMES C. JACKSON.

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Litchfield County Med. Society,	James Welch, William Woodruff.
Med. Department Yale College,	Worthington Hooker, Leonard J. Sanford.
Middlesex County Med. Society,	Miner C. Hazen, Elisha B. Nye.
New Haven County Med. Society,	L. N. Beardsley, Sheldon Beardsley, Timothy H. Bishop, E. W. Blake, Joel Canfield, Newton B. Hall.
New London Co. Med. Society,	Charles M. Carleton, Ashbel B. Haile, Ashbel Woodward.
Peters Medical Association,	G. H. Preston.
Tolland County Med. Society,	Wm. H. Richardson, Charles F. Sumner.
Windham County Med. Society,	Edwin A. Hill, John McGregor.
Permanent Members,	Ralph Deming, Frederick A. Hart, Denison H. Hubbard, Samuel S. Noyes, Lewis Williams.

DELAWARE.

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DISTRICT OF COLUMBIA.

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Prov. Marshal General's Bureau,	J. H. Baxter.
Permanent Member,	J. M. H. Lovejoy.

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Chicago Medical Society,	JOHN BARTLETT,
Chicago Medical College,	N. S. DAVIS.
Illinois State Medical Society,	L. T. HEWINS, A. L. MCARTHUR.
McLean County Medical Society,	D. L. CRIST.

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IOWA.

North Iowa Medical Society,	HORACE HAMILTON.
Scott County Medical Society,	W. F. PECK.

MAINE.

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Medical and Chirurgical Faculty of Maryland,	CHRISTOPHER C. COX, F. E. B. HEINTZE, PERRY S. KINNEMON, ORMSBY S. MAHON, GERARD E. MORGAN, W. C. VAN BIBBER.
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Broome County Medical Society,	CARLETON R. HEATON.
Buffalo Medical Association,	C. C. WYCKOFF.
Chemung County Med. Society,	H. S. CHUBBUCK, WM. C. WEY.
Chenango County Med. Society,	E. DARWIN HAYWARD.
Columbia County Med. Society,	H. B. SALMON.
Delaware County Med. Society,	ALMIRON FITCH.
Eastern Dispensary, N. Y. City,	HENRY LE BARON HARTT.
Fulton County Med. Society,	FRANCIS BURDICK.
King's County Med. Society,	R. M. BUELL.
King's County Hospital,	HOMER L. BARTLETT, R. CRESSON STILES.
Long Island College Hospital,	DE WITT C. ENOS.
Madison County Med. Society,	J. R. CHAMBERLAYNE.
Medical Association, Eastern District of Brooklyn,	NELSON L. NORTH, CARL WITTMAN.
Niagara County Med. Society,	B. L. DELANO.
New York Academy of Medicine,	JAS. ANDERSON, HENRY D. BULKLEY, FREEMAN J. BUMSTEAD, JOHN C. DALTON, JOEL FOSTER, SAMUEL T. HUBBARD, NATHANIEL C. HUSTED, J. FOSTER JENKINS, ERNEST KRACKOWIZER, JAS. L. LITTLE, J. MCNULTY, ALFRED UNDERHILL, JOHN R. VAN KLEEK, OLIVER WHITE.

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N. York Eye and Ear Infirmary,	HENRY D. NOYES.
New York County Med. Society,	THOS. S. BAHAN, R. A. BARRY, D. S. CONANT, JAS. J. CONNOLLY, HENRY S. DOWNS, HORACE P. FARNHAM, J. O. FARRINGTON, N. MARSTON FREEMAN, JAS. KENNEDY, JONATHAN S. LAWRENCE, JAS. R. LEAMING, J. R. MANSFIELD, C. PRINCE, CYRUS RAMSAY, JEROME CANDEE SMITH, JOSEPH WOOSTER.
New York State Medical Society,	DAVID P. BISSELL, THOS. C. BRINSMADE, GEO. BURR, H. W. DEAN, WM. GOVAN, STEPHEN ROGERS, JOHN SWINBURNE, A. L. SAUNDERS, PETER VAN BUREN.
N. Y. State Hospital for the Insane,	SAMUEL E. SHANTZ.
New York Obstetrical Society,	EDWARD R. PEASLEE, GUSTAVUS S. WINSTON.
New York Ophthalmic Hospital,	JOHN P. GARRISH, MARCUS P. STEPHENSON.
New York Pathological Society,	W. B. BIBBINS, ELLSWORTH ELIOT, THOS. C. FINNELL, G. FURMAN, A. JACOBI, JOS. A. MONELL, JAS. B. REYNOLDS, LEWIS A. SAYRE, LOTHAR VOSS, EVERARDUS B. WARNER.
Northern Dispensary, N. Y. City,	WM. S. LUDLUM.

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Oneida County Medical Society,	J. V. Cobb, Jacob Hunt, Lewis A. Tourtellot, Harold H. Pope, M. Calvin West.
Ontario County Medical Society,	Jos. Byron Hayes, J. W. Palmer.
Union Med. Association of Saratoga, Washington, and Warren Counties,	James Ferguson, Alfred J. Long, Tabor B. Reynolds.
University Medical College,	Chas. A. Budd.
Warren County Medical Society,	Hiram McNutt.
West Chester Co. Med. Society,	Jas. Hart Curry, Wm. S. Stanley.
Woman's Hospital,	Thos. Addis Emmet.
Permanent Members,	Jas. L. Banks, John Briggs, Douglas Bly, Levant B. Coles, Hiram Corliss, Isaac H. Douglas, J. Hancock Douglas, Lewis Elsberg, Wm. Fred. Holcomb, Julius Homberger, Elijah S. Lyman, Alden March, John T. Metcalfe, J. W. Richards, Sidney Stillman, John F. Whitbeck, S. G. Wolcott.

OHIO.

Academy of Medicine, Cincinnati,	G. A. Doherty M. B. Graff, A. E. Heighway, J. P. Walker, E. Williams.
Ohio State Medical Society,	Stephen O. Almy, Abel Carey.

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Washington Park Hospital,	O. D. NORTON.
Wayne County Medical Society,	JAS. D. ROBISON.

PENNSYLVANIA.

Allegheny County Medical Society,	ANDREW FLEMING.
Bucks County Medical Society,	BENJ. M. COLLINS.
Charity Hospital, Philadelphia,	JAS. M. BOISNOT.
Chester County Medical Society,	JOHN P. EDGE, JACOB PRICE.
College of Physicians of Philadelphia,	JAS. HOWELL HUTCHINSON, WM. MAYBURRY.
Delaware County Medical Society,	ISAAC N. KERLIN.
Lebanon County Medical Society,	B. F. SCHNECK.
Lycoming County Medical Society,	FRED. S. TREADWAY.
Medical Society of the State of Pennsylvania,	P. B. BREINIG, DANIEL HOLMES, ANDREW NEBINGER, L. A. SMITH, THEO. C. YEAGER.
Medical Society of the City of Reading and County of Berks,	EDWARD WALLACE.
Northampton County Med. Society,	TRAILL GREEN.
Northern Med. Assoc. of Phila.,	J. SOLIS COHEN.
Pathological Society of Phila.,	WM. SAVERY.
Philadelphia Co. Med. Society,	H. ST. CLAIR ASH, ROBERT BURNS, JOS. R. COAD, JAS. M. CORSE, JAS. CUMMISKEY, WM. L. KNIGHT, WINTHROP SARGENT.
University of Pennsylvania,	FRANCIS G. SMITH.
Permanent Members,	WM. B. ATKINSON, MANLY EMANUEL, JAS. W. KERR.

RHODE ISLAND.

Providence Medical Association,	ALEX. R. BECKER, LLOYD MORTON, W. H. TRAVER.

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Rhode Island Med. Association,	ARIEL BALLOU, SAMUEL W. BUTLER, SYLVANUS CLAPP, THEOPHILUS C. DUNN, J. W. C. ELY, GEO. W. JENCKES.
Permanent Members,	D. HOMER BATCHELDER, OTIS BULLOCK, GEO. CAPRON, JAMES H. ELDREDGE, JOHNSON GARDNER, JOS. MAURAN, TIMOTHY NEWELL, F. H. PECKHAM, USHER PARSONS, CHAS. W. PARSONS.

TENNESSEE.

Tennessee Medical Society,	W. K. BOWLING.

VERMONT.

Caledonia County Medical Society,	HIRAM S. BROWN.
Connecticut River Valley Medical Association,	CHAS. ALLEN, RIPLEY CLARK, Z. G. HARRINGTON, SAMUEL NICHOLS, D. R. STORY, LONGDON SOWYER, LEWIS E. SUMMERS.
Franklin County Medical Society,	GEO. C. BRIGGS.
Med. Dept. University of Vermont,	CHAS. L. ALLEN.
Orleans County Medical Society,	LUTHER W. ADGATE, D. W. BLANCHARD, W. B. MOODY, JONATHAN F. SKINNER.
Vermont State Medical Society,	SIMEON BELKNAP, NORMAN W. BRABY, CHAS. W. BRIGHAM, GATES B. BULLARD, CHAS. S. CAHOON, CHAS. B. CHANDLER, ABRAHAM HARDING,

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Vermont State Medical Society,	Edward Hazen, H. D. Holton, H. H. Niles, Ezra Paine, Jas. S. Richmond, Chauncey M. Rublee J. N. Stiles, E. V. Watkins, A. T. Woodward, E. F. Upham.
White Mountain Medical Society,	T. T. Cushman.
Permanent Members,	Zaccheus Bass, Wm. A. Chapin, Chas. S. Downes, Lewis Emmons, O. F. Fassett, Wm. M. Huntington, Henry Janes, Wm. McCollom.

ARMY AND NAVY.

Med. Department U. S. Army,	Thos. Antisell, G. H. Lyman, Geo. A. Otis, B. M. Sargent, Chas. S. Tripler, J. J. Woodward.
Med. Department U. S. Navy,	Jos. Beale, S. Jackson, Thos. L. Smith, J. Winthrop Taylor.

The following gentlemen were present by invitation:—

Drs. J. S. Brigham, of Montreal, Canada, Governor of the College of Physicians and Surgeons of the Upper Province; W. Marsden, of Quebec, President of the College of Physicians and Surgeons of Lower Canada; Stephen L. Foster, of Quebec, College of Physicians and Surgeons of Lower Canada; W. Bayard, of St. John, New Brunswick; Jas. P. De Wolf, of Halifax, W. P. Medical Association of Nova Scotia; Geo. Derby, U. S. V.; F. H. Gross, U. S. A. General Hospital of Readville, Massachusetts.

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FREDERICK A. HART, M.D., of Southington, Conn., was proposed as a Permanent Member by Dr. WORTHINGTON HOOKER, of Connecticut, and elected.

On motion of Dr. LYNDON A. SMITH, of New Jersey, all propositions for Permanent Membership were referred to the Committee of Arrangements.

The Permanent Secretary read the following communication:—

"NAVY DEPARTMENT, BUREAU OF MEDICINE AND SURGERY,
May 31, 1865.

"SIR: I regret to inform you that Dr. WHELAN will not be enabled to attend the meetings of the American Medical Association, of which he is one of the Vice-Presidents, in consequence of severe indisposition. * * * * * * *

Very respectfully your obedient servant,

P. J. HORWITZ,
Assistant to Bureau."

The President then delivered the annual address.

On motion of Dr. DAVID P. BISSELL, of New York, the thanks of the Association were tendered to the President for his able and interesting address, and a copy was requested for publication.

An invitation was received from Mayor Lincoln, of Boston, on behalf of the city, for the members to participate in an excursion down the harbor on Thursday afternoon, which was, on motion, accepted.

Reports of Committees being next in order, the President called the various committees with the following results:—

On Insanity as Occurring in Women: Dr. H. R. STORER, of Massachusetts, Chairman, presented a report, which was referred to the Section on Practical Medicine and Obstetrics.

On Alcohol and its Relations to Man: Dr. G. E. MORGAN, of Maryland, Chairman, presented a report, which was similarly referred.

On Drainage and Sewerage of Large Cities and their Influence on Public Health: No report.

On Microscopic Observation of Cancer Cells: The Secretary read a letter from the Chairman, Dr. LEONARD J. SANFORD, of Connecticut, explaining why he had been unable to report.

On motion of Dr. D. P. BISSELL, of New York, the subject was referred to the Section on Anatomy and Physiology.

On Quarantine: The Chairman, Dr. WILSON JEWELL, of Penn-

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sylvania, having been prevented from being present or making a report by reason of recent great bereavements in his family, on motion of Dr. MAYBURRY, of Pennsylvania, the Committee was continued.

On Medical Ethics: No report.

On the Microscope: Dr. JAS. M. CORSE, of Pennsylvania, presented a report, which was referred to the Section on Anatomy and Physiology.

On the Relations which Electricity sustains to the Causes of Disease: Dr. S. LITTELL, of Pennsylvania, reported. The report was referred to the Section on Practical Medicine and Obstetrics.

On the Morbid and Therapeutical Effects of Mental and Moral Influences: No report.

On the Causes of the Extinction of the Aboriginal Races of America: No report.

On the Causes and Treatment of Ununited Fractures: No report.

On Diphtheria: No report.

On the Uses and Abuses of Pessaries: No report.

On International Medical Ethics: No report.

On Climatology and Epidemic Diseases: Dr. C. A. LOGAN, of California, reported for that State, and Dr. B. H. CATLIN, of Connecticut, for his own State, which reports were referred to the Section on Meteorology and Epidemics: Drs. R. C. HAMILL, of Illinois, and THOS. ANTISELL, of the District of Columbia, reported progress, and were continued.

On Autopsies in Relation to Medical Jurisprudence: Dr. T. C. FINNELL, of New York, Chairman, presented a report, which was referred to the Section on Medical Jurisprudence.

On so-called Spotted Fever: The following letter from the Chairman, Dr. JAS. J. LEVICK, of Pennsylvania, was read, and on motion the Committee was continued for another year.

"The Committee of the American Medical Association to which was referred, in June, 1864, the subject of 'Spotted Fever,' so-called, begs leave to state that soon after the last annual meeting it prepared a series of questions addressed to the profession, soliciting information on 'Spotted Fever,' as it had appeared in different parts of our country. Through the kindness of the editors of our Medical Journals this paper was extensively circulated, and appears to have claimed considerable attention. Interesting replies to it have been received from Drs. Eaton, of Peoria, Ill.; Mills, of Millborn, Ill.; Prentiss, of Washington, D. C.; A. D. Hall, of

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Philadelphia; T. Green, of Easton, Pa.; F. Swain, of Ballardsville, Ky.; A. T. Field, of Des Moines, Iowa, and others.

"From these and other sources, the Committee had hoped to present its report at this time, but has been prevented from doing so, by the illness of the Chairman, from which he has but recently entirely recovered. .

"The Committee respectfully asks of the Association that it may be continued for another year.

"Should this request be granted, it again appeals to the Profession for notices of individual observations of this disease, which, when collected, it is hoped may render the report a complete synopsis of the phenomena of Spotted Fever, as exhibited by this disease in the United States.

"JAMES J. LEVICK.

"1109 ARCH ST. PHILADELPHIA, June, 3, 1865."

On the Introduction of Disease by Commerce and the means for its Prevention: Dr. A. NELSON BELL, of New York, Chairman, reported. The report was referred to the Section on Hygiene.

On Patent Rights and Medical Men: No report.

On Exsection, and its Connection with Conservative Surgery: Dr. LEWIS A. SAYRE, of New York, Chairman, reported as follows. The report was received, and the Committee discharged.

"Your Committee, who were appointed at the last meeting of the Association, held in New York, to make a report on Exsections, and their relation to Conservative Surgery, beg leave respectfully to report, that shortly after the meeting adjourned, the Chairman of the Committee issued a printed circular, of which the following is a copy, and forwarded it to all the members of the profession whose address could be obtained:—

'Dr. ——

'DEAR SIR: Having been appointed at the last meeting of the American Medical Association, as Chairman of a Committee on Exsections, and their relation to Conservative Surgery, I will feel much obliged if you will forward to me, at your earliest convenience, reports of any cases upon which you have operated, or that you know about and can be substantiated.

'Please state particularly the age, sex, previous condition of the patient, the joint involved, the cause of the disease, length of time it had existed, condition at the time of the operation, mode of its performance, after-treatment, and the result; together with such other observations as your experience may suggest, that would be practically useful to the profession.'

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"But few replies were received to this circular, and those generally referred to cases already reported in some of the various Medical Journals which had already been collected by Dr. HODGES of Boston, in his excellent and exhaustive report in 1861; and still more recently by Dr. LYONS, of Hartford, Conn., who, taking up the subject from the date of Dr. HODGES' report on Joints of the Lower Extremity, had brought it down to the 1st of January, 1865. This valuable paper of Dr. IRVING LYONS will be found in HAYS' *American Journal of the Medical Sciences* for January, 1865.

"Since this latter date, the time has been too short to give the result of any operation with satisfaction, and there is little therefore left for your Committee to glean from this field of observation, which has been so recently culled by two such honest and faithful observers as Dr. HODGES and Dr. LYONS, except to refer to their valuable papers on this important subject, and it seems like a work of supererogation to repeat what has been so perfectly done when nothing new can be obtained by the labor.

"Nearly one hundred cases of exsection of the various joints were received from the different army surgeons, and were arranged and tabulated with remarks, but on visiting Washington we ascertained that the Medical Bureau were preparing a complete report of all the cases that will have occurred during the war, and which will probably be the most perfect and extensive work of the kind ever compiled. And as the cases your Committee had collected would necessarily form part of this official report, it seemed to your Committee an act of injustice to mar its completeness by anticipation, in publishing part of its reports in fragmentary form, and we therefore forwarded to the proper department at Washington our collection, to be published in its proper place in the forthcoming official report, to which we beg leave to refer the Association and the profession generally. And your Committee would ask to be relieved from the further consideration of the subject.

"LEWIS A. SAYRE, M. D., *Chairman.*
"S. H. TEWKSBURY, M. D."

Papers on this subject by Dr. SAYRE, of New York, Dr. SAMUEL H. TEWKSBURY, of Maine, and Dr. W. F. PECK, of Iowa, were presented and referred to the Surgical Section.

On Ligature of the Subclavian Artery: The Secretary read a letter of explanation from Dr. WILLARD PARKER, of New York, Chairman, and on motion the Committee was continued.

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On Tracheotomy in Membranous Croup: Dr. L. A. SMITH, of New Jersey, stated that Dr. ALEXANDER N. DOUGHERTY, of New Jersey, Chairman, was absent in the army, and on motion the Committee was continued.

On Specialists, and Specialties: Dr. JULIUS HOMBERGER, of New York, Chairman, offered a report, which on motion was made the special order for Wednesday at 11 A. M.

On Compulsory Vaccination: Dr. A. N. BELL, of New York, Chairman, offered a report, which was referred to the Section on Hygiene.

On Rank of Medical Corps in the Army: Dr. CHAS. S. TRIPLER, U. S. A., Chairman, offered a report, which was, on motion, made the order of business for Wednesday after the report on Specialists.

On Rank of Medical Corps in the Navy: A report was offered by Dr. ANDERSON, of New York, Chairman, and made the order of business for Wednesday, after the preceding report.

The President having announced Voluntary Communications as in order, papers were presented:—

On Variola. By Drs. ANDREW NEBINGER, of Philadelphia, and C. RAMSAY, of New York. Referred to the Section on Practical Medicine and Obstetrics.

On motion of Dr. L. A. SAYRE, of New York, this vote was reconsidered, and these papers were referred to the Section on Hygiene.

On Ophthalmology. By Dr. E. WILLIAMS, of Ohio. Referred to Section on Surgery.

On Extraction of Foreign Bodies from the Ear and Nose. By Dr. LAURENCE TURNBULL, of Pennsylvania. Referred to Section on Surgery.

On Staphyloraphy. By Dr. J. MASON WARREN, of Massachusetts. Referred to the same Section, and by request made the special order for 3 P. M.

On Dislocations of the Femur, with Demonstrations. By Dr. H. J. BIGELOW, of Massachusetts. Referred to the same Section, and the Association were requested to consider it at the Massachusetts College on Wednesday afternoon.

On the Functions of the Nerves of Sensation and Motion. By Dr. BENJAMIN HASKELL, of Massachusetts. Referred to Section on Anatomy and Physiology.

On Dislocation of the Clavicle. By Dr. H. D. HOLTON, of Vermont. To the Section on Surgery.

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On a Case of Fibro-Sarcoma, etc. By Dr. LOUIS ELSBERG, of New York. To the same Section.

A letter from the Medical Director at Savannah, relative to the condition of the people of that region, was referred to the Section on Hygiene.

Dr. J. MASON WARREN, of Massachusetts, requested the Association to be present at an operation at the Massachusetts Hospital, on Wednesday morning. On motion of Dr. SAYRE, of New York, the motion fixing 11 A.M. of that day for the consideration of Dr. HOMBERGER'S paper on Specialists was reconsidered, and that paper made the special order for Thursday at 9 A.M.

On motion, it was agreed that the Association should meet at 8 A.M. on the subsequent days of the Session.

A communication from Dr. THOS. F. AZPELL, U.S.A., was announced, and referred to the Section on Hygiene.

The President introduced to the Association Dr. W. MARSDEN, President of the College of Physicians and Surgeons of Lower Canada, who made a few remarks in response.

On motion of Dr. JAMES F. HIBBERD, of Indiana, the delegates from each State and district represented were requested to meet immediately after the adjournment to select representatives for the Nominating Committee.

The President announced that the several Sections would meet at 3 P.M.

It was announced that the Association were invited this evening to a promenade concert at the Music Hall, given by the physicians of Boston.

On motion, the Association adjourned until 8 A.M. on Wednesday.

SECOND DAY.

WEDNESDAY, JUNE 7.

At 8½ A.M. the President called the Association to order.

The Secretary called the roll of delegates registered.

The following gentlemen were reported as composing the Committee on Nominations:—

Maine, THOS. A. FOSTER; New Hampshire, G. B. TWITCHELL; Vermont, H. D. HOLTON; Massachusetts, AUGUSTUS A. GOULD; Connecticut, ELISHA B. NYE; Rhode Island, SYLVANUS CLAPP; New York, D. W. C. ENOS; New Jersey, EZRA M. HUNT; Penn-

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sylvania, WM. MAYBURRY; Delaware, JAMES COUPER; Maryland, P. S. KINNEMON; Ohio, S. O. ALMY; District of Columbia, J. M. TONER; Indiana, JAS. F. HIBBERD; Illinois, JOHN BARTLETT; Missouri, J. S. B. ALLEYNE; Michigan, HOMER O. HITCHCOCK; Iowa, W. F. PECK; Tennessee, W. K. BOWLING; U. S. A., J. J. WOODWARD; U. S. N., T. L. SMITH.

On motion of Dr. W. MAYBURRY, of Pennsylvania, the Committee of Nominations were granted permission to withdraw at 9 A. M.

Dr. C. C. COX, of Maryland, after some remarks, and reading an abstract of certain evidence before the Military Court sitting in Washington for the trial of the assassins of the President, offered the following resolutions:—

Whereas, MONTROSE A. PALLEN, whose name appears upon the register as a permanent member of this Association, has been proved to have been in complicity with an attempt to poison the water of the Croton Reservoir, by which the city of New York is supplied with drinking water, thus imperilling the lives of thousands of his fellow-citizens; therefore

Resolved, That the said MONTROSE A. PALLEN has disgraced his manhood and the humane profession of which he is an unworthy member; that he is hereby indignantly expelled from this body; that the Secretary be required to strike his name from the roll of members; and that he shall never hereafter be eligible to membership in the American Medical Association.

A motion, by Dr. J. M. TONER, of the District of Columbia, to postpone action in the case until the next meeting of the Association, was negatived.

A motion, by Dr. HOOKER, of Connecticut, to refer to a Committee to report to-morrow, was also lost.

After much discussion, the resolutions were finally amended by striking out the last clause, "and that he shall never hereafter be eligible, &c.," and also substituting for the words "has been proved," the words "has been declared under oath before the military commission sitting in Washington at this date."

The preamble and resolutions were then adopted.

Dr. H. C. ROBBINS, of Illinois, stated that Dr. J. H. REYNOLDS, of Quincy, Ill., had been expelled from the County Medical Society of that place, and moved that his name be stricken from the list of members of this Association. This was lost, and the case was referred to the Committee on Medical Ethics.

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On motion, it was determined that the Association should meet on Friday at 9 A. M.

Dr. J. P. GARRISH, of New York, offered the following resolutions, which were unanimously adopted:—

Whereas, Our distinguished friend, Dr. Valentine Mott, has been called by death to leave us, in a mature old age and full of honors:

Resolved, That the American Medical Association has suffered a loss which is deeply felt by every member.

Resolved, That there is a vast debt of gratitude due not only from this Association, but from the community, to our distinguished friend and colleague for his teachings and brilliant achievements in surgery.

Resolved, That we tender to the family of the deceased our warmest sympathies for the bereavement they have sustained.

On motion of Dr. B. H. CATLIN, of Connecticut, the President was requested to appoint a committee of three to prepare suitable resolutions relative to the deaths of Drs. JONATHAN KNIGHT, BENJAMIN SILLIMAN, and CHARLES HOOKER, of Connecticut. Committee: Drs. B. H. CATLIN, and W. HOOKER, of Connecticut, and C. C. COX, of Maryland.

As no members of the former Committee on Medical Ethics were present, it was, on motion, discharged, and the President appointed as such committee, Drs. L. A. SMITH, of New Jersey, JAS. KENNEDY, of New York, W. HOOKER, of Connecticut, H. I. BOWDITCH, of Massachusetts, and A. L. MCARTHUR, of Illinois.

On motion of Dr. H. R. STORER, of Massachusetts, the paper on "Advertising by Medical Men," offered in behalf of the New York State Medical Society, was made the special order after that on "Specialists."

Dr. C. S. TRIPLER, U. S. A., read the report on "Rank of Medical Men in the Army," which was accepted and adopted.

Dr. C. C. COX, of Maryland, offered the following resolution, which was adopted:—

Resolved, That the Committee on Medical Rank in the Army be continued, and that each member of the Association be earnestly requested to urge representatives in Congress, and others having influence with the national legislature, to use all suitable means to advance the medical rank in the army to such an extent as will place the surgical corps on an equal platform in this regard, with other departments of the service.

On motion of Dr. H. I. BOWDITCH, of Massachusetts, the Presi-

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dent, Dr. N. S. DAVIS, was directed to bring this matter before the next session of Congress.

The report on "Rank of Medical Corps in the Navy" was read by Dr. ANDERSON, of New York, and, on motion, adopted.

On motion of Dr. LOOMIS, of the District of Columbia, the Committee was continued, and requested to act with the President in bringing this matter also before Congress.

The Committee on the Microscope, Dr. JAS. M. CORSE, of Pennsylvania, Chairman, presented a report, which was referred to the Section on Anatomy and Physiology.

The Committee of Publication, Dr. F. G. SMITH, of Pennsylvania, Chairman, presented their report, which was received. Appended to it was a resolution authorizing the Committee to assess each member such additional sum as will enable them to defray the expense of publishing the forthcoming report, provided the amount in the hands of the Treasurer shall prove to be insufficient for the purpose. A motion to amend, limiting the assessment to one dollar, was lost; also a resolution offered as a substitute for the original resolution. Subsequently, the resolutions as reported were adopted, with an amendment changing the word "assess" to "invite to contribute."

The Committee on Nominations reported the following resolution, which was adopted:—

Resolved, That the Committee on Nominations recommend the Association to order the several sections to select subjects german to their organization, to be reported on at the next annual meeting, to select the committees to take charge of these subjects, and to report their action herein to the Association at their earliest convenience.

The following communication from W. J. DALE, M. D., Surgeon General of Massachusetts, was read:—

"COMMONWEALTH OF MASSACHUSETTS, OFFICE OF SURGEON GENERAL,
BOSTON, June 7th, 1865.

"SIR: His Excellency Gov. Andrew directs me to acknowledge the receipt of your kind invitation to be present at the meeting of the American Medical Association, and to add his regrets that his absence from the city until date, prevented his acceptance.

"Fully appreciating the dignified character and importance of the Association, and freely and cordially acknowledging the patriotic sacrifices of the profession during the rebellion, he trusts that the

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meeting of this honored body will advance the great interests of Medical Science, and be both profitable and pleasant to the body of distinguished men present.

"I have the honor to remain,

"Very respectfully, your obedient servant,

"WILLIAM J. DALE,

"*Surgeon General.*

"To HENRY J. BIGELOW, M. D., *Chairman Committee of Arrangements, American Medical Association.*"

The Committee on Prize Essays, Dr. D. HUMPHREYS STORER, of Massachusetts, Chairman, reported as follows:—

"The Committee on Prize Essays beg leave to report that they have received a dissertation 'On the Surgical Treatment of Morbid Growths within the Larynx,' bearing the motto '*Quod vidi, scripsi,*' which they would unanimously recommend as worthy the usual prize of the Association.

"They would also award the premium offered at the last annual meeting of the Association for 'the best short and comprehensive tract calculated for circulation among females, and designed to enlighten them upon the criminality and physical evils of abortion,' to an essay with the motto '*Casta placent superis, castâ cum mente venito, et manibus puris sumito fontis aquam.*'

"In the preface to which the writer very modestly remarks: 'If it be considered by the Committee worthy its end, they will please adjudge it no fee, nor measure it by any pecuniary recompense. Were the finances of the Association such as to warrant it in more than the most absolutely necessary expenditures, yet would the approbation of the Committee and of the profession at large be more grateful to the writer than any tangible, and, therefore, trivial reward.'

D. HUMPHREYS STORER,
J. MASON WARREN,
H. I. BOWDITCH,
JOHN H. DIX."

The seals were then broken, and Dr. LOUIS ELSBERG, of New York, proved to be the successful competitor for the first of the prizes mentioned, and Dr. HORATIO R. STORER, of Massachusetts, the author of the Essay on Criminal Abortion.

On motion, the report was accepted and the essays referred to the Committee of Publication.

The Treasurer's report, showing the amount in the treasury to be $301 95, was read and accepted.

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Dr. T. C. FINNELL, of New York, presented a pathological specimen, which was referred to the Section on Hygiene.

A communication on Compulsory Vaccination was presented, and referred to the Section on Hygiene.

The Committee on Medical Education, Dr. T. ANTISELL, of District of Columbia, Chairman, presented a report, which was referred to the Committee of Publication.

Dr. ROBERT BURNS, of Pennsylvania, offered the following resolution, which was adopted:—

Resolved, That the Treasurer be directed to place in the hands of the Permanent Secretary one copy of each volume of the *Transactions* of this Association for the use of that office.

A communication from Dr. CHAS. A. LEE, of New York, Chairman of the Committee on Medical Literature, was read, explaining its failure to report.

On motion, the Committee was continued, with permission to present its report to the Committee of Publication.

The following gentlemen were proposed and elected Permanent Members: O. H. BRADLEY, East Jaffrey, N. H.; EDW. D. G. SMITH, U. S. N.; F. WINSOR, Winchester, Mass.; R. H. KING, Wolfsboro', Carroll Co., N. H.; ALBA E. KEMP, New Salem, Mass.; C. V. BEMIS, Medford, Mass.; DRYDEN SMITH, Biddeford, Me.; JOHN L. ALLEN, Saco, Me.; JOHN YALE, Ware, Mass.; DAVID W. MINER, Ware, Mass.; J. W. WINSLOW, East Hampton, Mass.; BENJ. MANN, Roxbury; J. H. WATERMAN, Westfield, Mass.; J. H. LONGENECKER, Feltonville, Mass.; J. S. LOMBARD, Boston; J. Q. A. MCCOLLISTER, South Groton, Mass.; GEORGE JEWETT, Fitchburg, Mass.; B. W. SARGENT, U. S. A., West Tennessee; EDWIN SEGUR, JEFFERSON CHURCH, and ALEXANDER S. MCLEAN, Springfield, Mass.; J. B. GOULD, Templeton, Mass.; SAMUEL G. WEBBER, Boston, Mass.; SILAS D. PRESBREY, Taunton, Mass.

The following amendment to the Constitution was offered by Dr. TONER, of the District of Columbia, and laid over till next year:—

To amend Art. 2, Sect. 4, concerning the assessment of members, by striking out from the first line the word "three," and from the second and third lines the words "as well as," and inserting the word "*five*" and the words "*and three dollars*" in the stead thereof respectively.

Vice-President Dr. W. HOOKER having taken the chair, Dr. N. S. DAVIS, Chairman of the Committee on Revision of the Plan of Organization, reported the revised plan of organization.

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On motion of Dr. L. A. SMITH, of New Jersey, the thanks of the Association were tendered to the Committee for the able manner in which they had attended to their duties.

A motion to amend the revised plan by inserting in the clause, relative to members speaking, the words "may be required to go to the stand," was adopted.

On motion of Dr. CATLIN, of Connecticut, the report was adopted.

The Committee on Nominations announced Cincinnati as the place for the next meeting.

On motion of Dr. COX, of Maryland, Baltimore was substituted, and the previous question having been called, the report as amended was adopted.

The Committee on Necrology, Dr. C. C. COX, of Maryland, Chairman, reported, and the paper was referred to the Committee of Publication.

On motion, the President was requested to appoint a committee to draft suitable resolutions relative to the decease of Dr. S. D. WILLARD, late Secretary of the New York State Medical Society.

Committee: Drs. THOS. HUN, HOWARD TOWNSEND, and JOHN SWINBURNE, of New York.

Invitations for social entertainments this evening were extended to the Association by Drs. JACOB BIGELOW, D. H. STORER, J. M. WARREN, G. C. SHATTUCK, J. H. DIX, H. R. STORER, H. J. BIGELOW, J. B. UPHAM, and H. W. WILLIAMS.

On motion, the Association adjourned until 8 A. M. Thursday.

THIRD DAY.

THURSDAY, JUNE 8.

The President called the Association to order at 8½ A. M.

Dr. ROBERT BURNS, of Pennsylvania, offered the following resolutions, which were adopted:—

Resolved, That the several Sections of this Association be requested, in the future, to refer no papers or reports to the Committee of Publication, except such as can be fairly classed under one of the three following heads, viz: 1st. Such as may contain and establish *positively* new facts, modes of practice, or principles of real value. 2d. Such as may contain the results of well-devised original, experimental researches. 3d. Such as present so complete

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a review of the facts on any particular subject as to enable the writer to deduce therefrom legitimate conclusions of importance.

Resolved, That the several Sections be requested, in the future, to refer all such papers as may be presented to them for examination by this Association, that contain matter of more or less value, and yet cannot be fairly ranked under either of the heads mentioned in the foregoing resolution, back to their authors with the recommendation that they be published in such regular medical periodicals as said authors may select, with the privilege of placing at the head of such papers, "Read to the Section of the American Medical Association on the day of 18 ."

On motion of Dr. MAYBURRY, of Pennsylvania, the Committee of Publication were directed to prefix to the list of Officers and Permanent Members, the names of all the Ex-Presidents and Ex-Vice-Presidents, with their residences.

On motion of Dr. L. A. SAYRE, of New York, after much discussion, the Committee of Publication were vested with discretionary power in the preparation and publication of the matter referred to them for publication.

On motion of Dr. EDWARD JARVIS, of Massachusetts, a Section on Psychology was added to the Sections already founded.

A motion by Dr. J. P. GARRISH, of New York, to found a Section on Ophthalmic Medicine and Surgery was negatived after much discussion.

On motion of Dr. J. P. HIBBERD, of Indiana, the Section on Anatomy and Physiology was abolished, and Anatomy added to the Section on Surgery, and Physiology to that on Hygiene.

On motion of Dr. COUPER, of Delaware, it was resolved that the Association shall send, annually, a delegate to the "Association of Medical Superintendents of Insane Asylums," one of whose duties it shall be to urge upon that Association the advantage, for all purposes of science, of a more intimate union with this Association.

The President appointed Dr. H. R. STORER, of Massachusetts, as the delegate for the current year to the meeting at Pittsburg, Pa.

Dr. MAYBURRY, of Pennsylvania, offered the following amendment to the Constitution, which was laid over:—

Add to paragraph 14 of Art. II. of the Constitution (end of 15th line, page 341 of *Transactions* of 1864), after "unanimous vote," the following:—"and shall continue such so long as they remain in good standing in the body from which they were sent as delegates."

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Dr. D. P. BISSELL, of New York, offered the following, which was also laid over:—

First. Strike out the word "ten" and insert the word "twenty" in the *third* paragraph of the second section of the Constitution, and also add at the close of the said paragraph the following:—

Provided, Each local Society, now entitled to representation in the Association, shall have the privilege of sending one delegate, although composed of a less number of resident members than above named.

Second. Amend the 12th paragraph of the second section so that it shall read, "The *members by invitation* shall consist of practitioners of medicine of reputable standing;" "they shall receive their appointment by invitation of the meeting after an introduction from, and being vouched for by, any of the members present, or any of the absent permanent members. They shall hold their connection with the Association until the close of the annual session at which they are received, and shall be entitled to participate in all the offices of the Association, but shall not have the right of voting."

Third. Amend the 16th paragraph of the second section so that it shall read, "The permanent members shall at all times be entitled to attend the meetings and participate in the offices of the Association so long as they shall continue to conform to its regulations, but without the right of voting," and repeal the remaining part of the paragraph.

Fourth. Add an additional paragraph, as follows:—

"All Ex-Presidents and Ex-Vice-Presidents, and all permanent members of the Association, who have attended, as delegates, four annual meetings of the Association, shall possess all the powers and enjoy all the rights of elected delegates."

The Committee on Nominations reported as follows:—

Time of meeting, June.

PRESIDENT.

D. HUMPHREYS STORER, *of Massachusetts.*

VICE PRESIDENTS.

JAS. F. HIBBERD, *of Indiana.*
S. O. ALMY, *of Ohio.*
T. C. DUNN, *of Rhode Island.*
W. P. JOHNSON, *District of Columbia.*

ASSISTANT SECRETARY.

GERARD E. MORGAN, *of Maryland.*

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Committee of Arrangements.—Drs. C. C. Cox, W. C. Van Bibber, Franklin Donelson, L. H. Steiner, George G. Miltenberger, Wm. Whitridge, Gerard E. Morgan, all of Maryland.

Committee of Publication.—Drs. F. G. Smith, of Pennsylvania; H. F. Askew, of Delaware; Wm. Mayburry, of Pennsylvania; W. B. Atkinson, of Pennsylvania; H. R. Storer, of Massachusetts; Caspar Wister, of Pennsylvania.

Committee on Prize Essays.—Drs. Austin Flint, Sen., Jas. R. Wood, Ellsworth Eliot, E. Krackowizer, D. W. C. Enos, all of New York.

Committee on Medical Education.—Drs. S. D. Gross, of Pennsylvania; G. B. Twitchell, of New Hampshire; C. A. Pope, of Missouri; O. W. Holmes, of Massachusetts; Grafton Tyler, of District of Columbia.

Medical Literature.—Present Committee continued: Charles A. Lee, of New York; T. F. Rochester, of New York; C. C. Cox, of Maryland; Albert Smith, of New Hampshire; A. Nebinger, of Pennsylvania.

Committee on American Necrology.—Drs. C. C. Cox, of Maryland; E. B. Stevens, of Ohio; W. F. Peck, of Iowa; H. Van Dusen, of Wisconsin; Noble Young, of District of Columbia; Josiah Simpson, of U. S. A.; Jos. C. Weston, of Maine; Henry Bronson, of Connecticut; Henry Noble, of Illinois; Chas. Eversfield, of U. S. N.; Wm. B. Fletcher, of Indiana; J. C. Hupp, of W. Virginia; Jos. Mauran, of Rhode Island; Wm. K. Bowling, of Tennessee; J. P. Fitch, of New Hampshire; James Couper, of Delaware; W. L. Linton, of Missouri; Chas. L. Allen, of Vermont; Henry Clarke, of Massachusetts; J. H. Griscom, of New York; E. M. Moore, of New York; Chas. A. Logan, of Kansas; Wm. B. Little, of California; —— Stewart, of Minnesota; Henry Miller, of Kentucky; S. G. Armor, of Michigan; Wm. Pierson, of New Jersey; Andrew Fleming, of Pennsylvania; Edward Wallace, of Pennsylvania.

On motion of Dr. Sayre, of New York, the report was amended to read 1st Tuesday in May, after which it was adopted.

A motion by Dr. T. Antisell, of the District of Columbia, to reconsider the action in the case of Montrose A. Pallen, was decided in the negative.

A call by Dr. Sayre, of New York, for the ayes and nays on this motion was decided by the President as not sustained.

A second motion to reconsider being made, and the vote taken

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by the members rising, it was lost by 59 in the affirmative and about 350 in the negative.

The President appointed Drs. H. A. JOHNSON, of Illinois, and C. C. COX, of Maryland, delegates to foreign medical associations.

The Committee on Medical Ethics reported the following in the case of Dr. J. H. REYNOLDS, of Illinois:—

"The Committee on Medical Ethics, to whom was referred the case of Dr. J. H. REYNOLDS, of Illinois, beg leave to report, that they have had the subject under consideration, and offer the following letter from Dr. R., which relieves the Society from further action at this time.

L. A. SMITH,
HENRY I. BOWDITCH,
WORTHINGTON HOOKER,
JAMES KENNEDY,
A. L. McARTHUR.

'BOSTON, June 8, 1864.

'*To the Committee on Medical Ethics of the American Medical Association*—

'GENTLEMEN: I learn, with deep regret, that objections have been made to my admission, at the present time, as a delegate to this Association.

'I intend, at the earliest possible moment, after my return home, to seek redress of the Adams County Medical Society, which has made these objections; meanwhile, I respectfully ask to be allowed to withdraw my credentials to this body.

Respectfully submitted,
J. H. REYNOLDS.'"

On motion, the name of Dr. REYNOLDS was withdrawn as a delegate.

A number of names were presented as candidates for permanent membership, and lost for want of unanimity. The vote was reconsidered, and the names laid on the table.

Dr. TONER, of the District of Columbia, offered the following amendment to the Constitution, which was laid over:—

Strike out from paragraph 14, Art. II. page 341, *Transactions*, 1864, the following: "and of such other members as may receive the appointment by unanimous vote."

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Dr. W. HOOKER, of Connecticut, from the Committee appointed for that purpose, presented the following resolutions:—

Resolved, That in the death of Dr. JONATHAN KNIGHT, twice a President of this Association, the duties of which office he discharged with extraordinary ability, the Medical Profession has lost one of its brightest ornaments; an eminent surgeon, who was conservative in the true sense of that term; a teacher, who, by his transparent clearness and terse eloquence, unsurpassed among medical men in this country, exerted through fifty years a wide influence upon the character of the American medical mind; a Christian gentleman, whose genial qualities won for him, to an extent seldom witnessed, the affections not only of intimate friends, but of all those who knew him.

Resolved, That in lamenting the sudden departure from this life of Dr. CHARLES HOOKER at the height of his usefulness, we cherish the memory of one whose independent mind, restless activity, and Christian faithfulness obtained for him great eminence both as a physician and a teacher of medicine; we call to mind with special pleasure his earnest devotion from the outset to the interests of this Association.

Resolved, That we revere the memory of PROFESSOR BENJAMIN SILLIMAN, who, as a leader in the diffusion of science in this country, as well as abroad, was one of the great benefactors of the race, and who by his urbanity, kindness of heart, and cheerful piety, enhanced to an uncommon degree his influence upon the community as a man of science.

The report was received, the resolutions unanimously adopted, and the Committee discharged.

Dr. GUIDO FURMAN, of New York, read the following action of the Medical Society of the State of New York, prefacing it with the following remarks:—

"*Mr. President:* Before the report from the Committee on Specialties is read, I wish to lay before this Association some resolutions passed by the Medical Society of the State of New York at its last annual meeting, held in February of the present year, and to give a brief account of the circumstances and time in which they originated, all of which is directly pertinent to the subject. The resolutions referred to, read as follows:—

Resolved, That in the opinion of this Society it is impossible to define the limits of advertising medical specialties, either in medical or other journals.

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Resolved, That advertisements indicating location and residence are the utmost limits of self-announcement consistent with professional dignity; and that all reference to special branches of medical practice as extra inducements to patronage should be deemed violations of the code of medical ethics.

Resolved, That hereafter any medical practitioner so offending shall be deemed disqualified as delegate to, or for membership of this Society, and if already a delegate to, or a member thereof, shall be deemed a fit subject for discipline.

Resolved, That this Society recommends all Medical Societies in the State of New York to adopt the foregoing resolutions, with a view to establish the true dignity of our profession.

Resolved, That the foregoing resolutions be transmitted to the American Medical Association, at its next meeting, as an expression of the opinion of the Medical Society of the State of New York, and that for this purpose a committee of presentation be appointed.

THOS. C. BRINSMADE,
HOWARD TOWNSEND,
GUIDO FURMAN,
Committee.

"The circumstances leading to the passage of these resolutions are briefly these:—

"In November, 1863, an advertisement appeared in the *New York Evening Express*, a lay journal, calling the attention of the public to the great skill and success of a physician who was devoting himself to the treatment of a special class of disease.

"This practitioner being a member of the New York County Medical Society, the '*Comitia Minora*' of that body instructed its Secretary to seek an explanation.

"Satisfactory evidence was given that the advertisement had been inserted without the permission of the physician mentioned, and he was of course exonerated.

"Inasmuch, however, as the attention of the Society had been drawn to the subject of medical advertisements, after considerable discussion, the following resolution, introduced by Dr. FURMAN, was adopted January 4, 1864.

Resolved, That in view of the unsettled state of opinion among medical practitioners, concerning the propriety of advertising Specialties in medical or other journals, the delegates of this Society be instructed to bring this subject before the Medical Society of

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the State of New York, at its next meeting, with a view to the establishment of some definite regulations concerning it.

"In obedience to the instructions contained therein, the subject was brought before the New York State Medical Society, and the resolutions already read, were reported, and made the special order of business at 12 o'clock on the second day of the annual meeting for 1865, when they were adopted, without one dissenting voice."

This paper was laid on the table for the present.

Dr. JULIUS HOMBERGER, of New York, Chairman of the Committee on Specialists, presented a report from that Committee, signed only by himself. After being read, on motion of Dr. HOLTON, of Vermont, it was laid on the table.

Dr. H. R. STORER, of Massachusetts, of the same Committee, presented a report signed by himself, which was read, and on motion of Dr. LOOMIS, of District of Columbia, also laid on the table.

Drs. W. HOOKER, of Connecticut, and T. C. BRINSMADE, of New York, of the same Committee, reported that the Committee had never been called together, and that they had not seen either report, until at so recent a date as to allow no time for consideration.

On motion, the papers and the whole subject were referred to the Committee on Medical Ethics, which Committee were instructed to report some definite action for the Association in this matter.

The hour having arrived that had been appointed for the steamboat excursion provided for the Association by the authorities of the city of Boston, on motion, the Association adjourned until Friday, at 8 A.M.

FOURTH DAY.

FRIDAY, JUNE 9.

The President called the Association to order at 8½ o'clock A.M.

The Section on Hygiene presented a report of their proceedings, which was accepted and referred to the Committee of Publication.

On motion, the bill of the Committee on Compulsory Vaccination for $11 43, was ordered to be paid by the Treasurer.

The Section on Practical Medicine and Obstetrics presented a report, which was accepted and similarly referred, and the appended resolutions adopted.

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The Section on Meteorology and Epidemics reported, with a similar action.

The Permanent Secretary having stated that no meeting of the Section on Anatomy and Physiology had been held;

On motion, the report of Dr. J. M. CORSE, of Pennsylvania, Chairman of the Committee on the Microscope, was referred to a special committee, with instructions to examine the paper and report directly to the Permanent Secretary. Committee, Drs. JOSEPH LEIDY, F. G. SMITH, and H. HARTSHORNE, of Pennsylvania.

On Patent Rights and Medical Men, Dr. DAVID PRINCE, of Illinois, Chairman, presented a report.

A motion to refer it to a special committee, with power to forward it directly to the Committee of Publication, was offered and negatived.

On motion, the report was referred to the Committee who had presented it for another year, with an explanation that it was received too late for proper consideration.

On International Medical Ethics, Dr. J. BAXTER UPHAM, of Massachusetts, Chairman, presented the following communication:—

"SENATE CHAMBER, June 8, 1865.

"Dr. H. R. STORER, *Assistant Secretary American Medical Association*—

"DEAR SIR: I was necessarily absent at the time my name was called for a report, as Chairman of the Committee on International Medical Ethics.

"I feel that a word of apology is due from me to the Association for not being in readiness with my report. It is evident, however, that a proper preparation for such a document could only be had by actual study and consideration of the subject in the various countries of Europe.

"I have twice, after consultation with my associates on the Committee, made all arrangements for a tour, having this object in special view; but on both these occasions the contingencies of the war prevented, and inasmuch as I do not see any immediate prospect of carrying such plans into effect, I respectfully ask to be discharged from further duty on this Committee.

"I have the honor to be,

Very respectfully, your obed't serv't,

J. BAXTER UPHAM."

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On motion, the Committee was discharged.

The Committee on Alcohol and its Relations to Man, Dr. GERARD E. MORGAN, of Maryland, Chairman, asked for an extension of time, and that Dr. J. R. W. DUNBAR be added to the Committee.

On motion, the Committee was continued, and the name of Dr. J. R. W. DUNBAR added.

The Section on Surgery presented the report of its proceedings, which was accepted and referred to the Committee of Publication.

The minutes of the entire session were read by the Permanent Secretary and adopted.

At the conclusion of the reading of the minutes, Dr. MARSDEN, of Quebec, the President of the College of Physicians and Surgeons of Lower Canada, rose and said:—

"*Mr. President:* May I be permitted to make a few brief remarks, in explanation of what I said on the first day of this session in returning thanks for the honor done me in introducing me to the meeting. I am rejoiced that I did not leave yesterday, as I had intended; having learned, since I came into this hall to-day, that the remarks I made were misunderstood by some of the gentlemen present, and were considered as not complimentary, which was the very reverse of what I intended. In expressing my approval of your excellent and elaborate address, I said, or intended to say, that I could, from my own experience, having been engaged in medical training, teaching, and examining for license, for upwards of a quarter of a century, bear witness to the advantages resulting from the more extended curriculum and increased length of the courses of lectures at present; whereas, when the course of lectures was of only twelve or thirteen weeks' duration, the candidates came up exceedingly weak and ill prepared, but now, when the course was five or six months long the difference was most apparent; and only at the last examination of candidates by the college, two young men, citizens of the United States, who wished to practice in Canada, passed examinations before our college that did honor to themselves and the profession to which they belong, and would have done credit to young gentlemen coming from any of the European schools. In conclusion, I have to thank you, Mr. President, for the patience with which you have heard me."

An invitation from Dr. GEORGE OSBORNE, to visit the Military

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Hospital at Readville, was received, and the thanks of the Association tendered therefor.

The following protest was offered by Dr. J. P. ORDWAY, of Massachusetts:—

"*Whereas*, On the 7th day of June, 1865, in a regular session of the American Medical Association, the following preamble and resolution were offered by Dr. C. C. COX, of Maryland, viz:—

'*Whereas*, MONTROSE A. PALLEN, whose name appears upon the register as a permanent member of this Association, has been proved to have been in complicity with an attempt to poison the Croton reservoir, by which the city of New York is supplied with drinking water, thus imperilling the lives of thousands of his fellow citizens, therefore,

'*Resolved*, That the said MONTROSE A. PALLEN has disgraced his manhood and the humane profession of which he is an unworthy member, that he is hereby indignantly expelled from this body, that the Secretary be required to strike his name from the roll of members, and that he shall never hereafter be eligible to membership in the American Medical Association.'

"*And whereas*, This preamble and resolution were amended by striking out of the preamble the words 'has been proved,' and inserting instead thereof the words, 'has been declared under oath before the Military Committee sitting in Washington at this date,' and by striking out from the resolution the words, 'and that he shall never hereafter be eligible to membership in the American Medical Association,' and then adopted, thereby in effect declaring that the Association 'indignantly expelled' a member who was charged with a heinous offence, but against whom it had, also, formally declared no sufficient proof had been adduced.

"*And whereas*, The Association refused, by vote, to reconsider its action in this behalf, now, therefore,

"We, the undersigned members of the American Medical Association now in attendance, while we execrate the crime with which Dr. PALLEN stands charged, and would, if his guilt were established, most promptly and heartily vote for his expulsion, do most respectfully protest against the action of this Association as above recited, on the general principle that all sense of right and justice, as well as the established rules of this Association, demands that no man shall be condemned and punished until his guilt is established.

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"And we desire that this protest shall be spread upon the record in the minutes of proceedings of this annual meeting.

THOMAS ANTISELL,	JAMES F. HIBBERD,
HENRY I. BOWDITCH,	LEWIS A. SAYRE,
GEORGE B. TWITCHELL,	S. H. TEWKSBURY.
S. L. ABBOT,	WORTHINGTON HOOKER,
W. P. PARR,	JULIUS HOMBERGER,
S. W. DREW,	A. C. HUSTED,
JOHN T. METCALFE,	T. A. EMMET,
C. D. HOMANS,	G. S. WINSTON,
J. W. WINSLOW,	WILLIAM GOVAN,
J. H. WARREN,	MOSES W. WELD,
J. H. CURRY,	WM. H. THORNDIKE,
BENJ. S. SHAW,	JOHN P. ORDWAY,
R. L. HODGDON,	B. F. BUXTON,
N. S. DAVIS,	GUIDO FURMAN,
LOUIS ELSBERG,	J. R. MANSFIELD,
JOHN BARTLETT,	J. FOSTER JENKINS,
CHAS. CARROLL STREET,	D. P. BISSELL.

"BOSTON, June 8, 1865."

On motion, it was received and ordered to be placed upon the minutes.

On motion of Dr. EZRA M. HUNT, of New Jersey, a committee of three was appointed to reply to the protest. Committee, Drs. EZRA M. HUNT, of New Jersey, W. B. BIBBINS, of New York, and J. H. BAXTER, of the District of Columbia.

The President read the following letter from Vice-President W. H. MUSSEY, of Ohio.

"CINCINNATI, June 4, 1865.

"Dr. N. S. DAVIS, *President of the American Medical Association*—

"DEAR SIR: I am greatly disappointed in being compelled to absent myself from the meeting of the Association this year. My plans were all made for a visit to Boston, but at this last moment, I am compelled to relinquish them, the sickness of my child making my presence here indispensable.

"I wished, among other things, to have placed on record a censure of the course of the present Surgeon-General (Barnes), in consulting with a homœopath in the case of Secretary Seward and son, and allowing a quack to prescribe medically, whilst he was attending surgically, it being an offence of no mean proportions,

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the high position of the parties making the demoralizing effect the greater. I hope it will not be passed over. * * * * * *

Very truly, &c.,

W. H. MUSSEY."

Dr. EDWARD WALLACE, of Pennsylvania, also read a communication on this subject, which had appeared in numerous papers throughout the country.

J. J. WOODWARD, Assistant Surgeon U. S. A., of the District of Columbia, made a lengthy explanation completely exonerating Surgeon-General Barnes from all these charges, and showing most positively their falsity.

On motion, the names of gentlemen offered as candidates for Permanent Membership, and laid on the table yesterday, were taken up, and the following were elected: Drs. CHAS. C. JEWETT, of Saxonville, Mass.; SAMUEL H. HURD, of Charlestown, Mass.; H. COWLES, of Saxonville, Mass.; and C. D. CLEAVELAND, of Boston, Massachusetts.

The names of Drs. SHERMAN, of and H. G. MCINTIRE, of Concord, N. H., were, after much discussion, again tabled.

At this point his Excellency JOHN A. ANDREW, the Governor of the Commonwealth, preceded by the Sergeant-at-Arms, and accompanied by Assistant Surgeon-General HOOKER, entered the hall, and was received by the Association, the members rising in their seats. His Excellency was introduced by the President, and addressed the Association as follows:—

"MR. PRESIDENT AND GENTLEMEN OF THE CONVENTION: I did not presume to enter the hall with the intention of interrupting the proceedings of the body which has met beneath the arches of the Hall of the House of Representatives, but for the purpose, in the first place, of testifying by my presence and my voice, and to respectfully acknowledge, the honor conferred upon me by the Convention in the invitation to attend and to address this meeting on the morning of its first convening. Having been prevented by illness from doing so, I felt it due to myself and the body assembled to avail myself of the earliest practical moment of passing a short time in the presence of this large assembly of the most learned and wisest of the medical profession; but more, I must say, I felt it to be due to the Commonwealth, one of whose official representatives I am, to testify in praise, and with emphasis also, to the interest which it attaches to such meetings of gentlemen of the

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learned profession of medicine. The interest it attaches to it, not only from its relation to the cause of science, but in relation to the cause of popular progress in many of the departments of human learning. The interest, also, which it attaches to the medical profession in its relation to the patriotism of the people, since that profession represents the body of men whose devotion, whose energy, whose skill, whose ability, and whose usefulness have not been surpassed, during these last four years of Southern war, by any similar number of citizens of the United States. And I trust, Mr. President, that this meeting in the city of Boston will be but the introduction of your Association to the city, and that the capital of the Commonwealth may witness many returns of a similar reunion. And I hope that wherever your honorable body may meet hereafter, it will receive the same cordial welcome of an intelligent people capable of appreciating learning, capable of understanding adequately and valuing the contributions of such men, alike to the health and morals and to the sentiments of the people. For I believe, sir, that reasonable, progressive, and philosophic views in regard to the treatment of disease, or deranged health in all the forms of altered life, are both useful in respect to that which is perishable in our mortal bodies, and in respect to that which is eternal in the immortal mind. I am happy to learn, Mr. President, that the meeting of the Convention has been attended on the present occasion with so many circumstances of interest and value, and cordially thanking you for this opportunity of addressing the Convention, and wishing the body themselves future happiness and prosperity for many years to come, I have the honor to take my leave."

At the conclusion of his address his Excellency retired, and the Association resumed its business.

Dr. CHAS. L. IVES, of Connecticut, offered the following resolution, which was unanimously adopted:—

Whereas, It has been several times intimated that an irregular practitioner has been elected a Permanent Member, be it

Resolved, That the subject be inquired into, and, if true, the elected candidate and his voucher be expelled from membership.

The name of Dr. H. G. MCINTIRE, of New Hampshire, was again taken up, and after several motions, which were negatived, and much discussion had ensued, the case was referred to the Committee on Medical Ethics.

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Dr. EZRA M. HUNT, of New Jersey, from the Committee on Reply to the Protest, offered the following:—

"We, the undersigned, beg leave to recommend the following reply to the protest of certain members of the American Medical Association against the action of said Association in the case of one MONTROSE A. PALLEN.

"We remark, *first*, as to the right of protest in an Association of this kind, that it is one which needs scarcely ever to be exercised, and the use of which is, in general, a bad precedent. Where a motion is fairly before a body, is carefully considered, and then deliberately acted upon, that submission to law and to majority, which is important to be cultivated as a principle, and which is particularly needed to be exemplified by prominent men as the grand lesson taught by the times, should make the minority content to express their dissent in the usual method. With due deference to those who signed the protest, we cannot but express our regret, that while in the course of years many points have been discussed before this body involving direct medical interests, and yet have been left to the decisions of the majority, so far as we know the first case calling forth a protest is in behalf of a man, in reference to whom we had the distinct statement from Dr. C. C. COX, of Maryland, that he, early in the war, left St. Louis in the interests of the rebellion, and that the testimony in the case referred to was explicit in reference to his complicity with the attempted crime. We, at least, exercise no right not already granted to these protestants in expressing our dissent from the propriety of their action in not submitting to the decision of this body after the question was once discussed, and then twice after reconsidered, and the former action reaffirmed, and that, too, in the absence of the gentlemen who were the movers of the resolution. *Secondly*, we beg leave to notice the fact that the protestants have erred as to matters of fact. The Association have in no way 'formally declared that no sufficient proof had been adduced of the guilt of Montrose A. Pallen.' The fact that the word 'proved' was amended by the insertion of the words 'has been declared under oath' is merely the difference between the legal issuing of a case and that kind of evidence which is entirely satisfactory and conclusive to even a guarded public sentiment. It was on this evidence, and on the formal statements and opinions of members that the Association saw fit to base their action. They felt that the course of Pallen, previous to this averred act, and the testimony in the case were sufficient grounds for their

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action. There are times when a man may be known by the company he keeps, and in such a barbarous wickedness as the one involved, the whole testimony and evil association justify us in this action.

"If the case were one that could be tried by us, so much the better, but the grounds of suspicion are so enormous as, in our view, to justify our course of action. We are not injuring him, for the load already upon him is one to which ours will not add a feather. We are but protecting ourselves. When evidence of mistake is shown we will gladly acknowledge our error and retract our course, but it is not harsh for us to separate from our Association one who has been in intimate association with the vilest enemies of humanity. We have high ideas of personal rights, but one who has been in leagued friendship with those making boldest attack on the dearest personal rights of universal humanity, cannot complain that he is cut off, until his character is vindicated, from association with those who, by profession as well as by their manhood, are philanthropists and patriots. While we agree to the general idea that no man shall be condemned and punished until his guilt is established, we recognize guilt as having degrees, and as sometimes being established independent of the decision of courts, and in cutting him off from the Association we do not recognize ourselves as 'condemning and punishing him' in the legal and opprobrious sense in which those terms are used when one is consigned to the prison or the gallows, but as protecting ourselves from the odium of association with one, in respect to whom we have evidence enough to satisfy us that he has chosen as associates not only rebels but assassins, and who, while he is unable to clear his skirts, is not particularly jeoparded in life, liberty, or the pursuit of happiness by our act.

EZRA M. HUNT,
W. B. BIBBINS,
J. H. BAXTER."

The reply was ordered to be placed on record.

During the discussion of this subject the following telegram from MONTROSE A. PALLEN was received, and read:—

"MONTREAL, C. E., June 9, 1865.

"*To President National Medical Association*—

"I have been expelled from the Association upon unrebutted testimony for participating in a crime which I execrate as much as any gentleman in the Convention. I will produce affidavits to

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prove Sanford Conover's evidence to be infamous perjury. I beg a reconsideration of the vote, and that it be referred to a committee, before whom I pledge myself to still preserve the fair fame belonging to every member of the Association.

MONTROSE A. PALLEN."

Dr. JOHN C. DALTON, of New York, moved that the reply of the Committee be accepted, and adopted as the sense of the Association.

On motion, the whole subject was laid on the table.

Dr. J. P. GARRISH, of New York, offered the following resolutions, which were unanimously adopted:—

Resolved, That the members of the American Medical Association, with heartfelt and national pride, extend to the army and navy surgeons their thanks for the prompt manner in which they have met the calls and perils of the battle-field demanded by our country.

Resolved, That we tender to the families and friends of those who have sacrificed their lives in the cause of humanity our warmest sympathies for the bereavement they have sustained. They have restored to us and the whole nation a peaceful and happy home for all future time.

Dr. TWITCHELL, of New Hampshire, moved to amend the Constitution in such a manner as to strike from its roll all those living members who have paid nothing for five years last past, into the treasury of this Association.

Laid over.

Dr. COUPER, of Delaware, moved that the list of Permanent Members be revised by the Committee on Necrology so as to properly designate all members who had deceased. Adopted.

On motion of Dr. H. I. BOWDITCH, of Massachusetts, the following resolution was adopted:—

Resolved, That the vote passed in 1863, relative to the establishment of Hunter prizes be rescinded, and that the small balance of money now in the hands of the Chairman of the Hunter Fund be transferred to the Treasurer of the Association, to be used by him for general expenses.

Dr. R. BURNS, of Pennsylvania, offered the following, which was unanimously adopted:—

Resolved, That the American Medical Association, in closing their annual session in the city of Boston, June 9th, 1865, do most sincerely tender a vote of thanks to their medical brethren, the Governor of Massachusetts, city authorities, and inhabitants of

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Boston, for their very kind and generous hospitalities to the assembled delegates from all parts of our country, and in bidding them farewell, we shall ever cherish the remembrance of their kindness and express the hope that prosperity, with every domestic, social, intellectual, and religious blessing may be their abiding portion.

Dr. JAS. KENNEDY, of New York, offered the following, which were unanimously adopted:—

Resolved, That the thanks of this Association are due, and are hereby presented to the Committee of Arrangements for the faithful and satisfactory manner in which they have discharged the arduous duties imposed upon them.

Resolved, That the thanks of this Association be presented to the retiring President, Dr. N. S. DAVIS, for the singularly able and impartial manner in which he has discharged the duties of his office.

On motion of Dr. J. R. VAN KLEEK, of New York, the following was adopted:—

Resolved, That this is a National Association, and, as in its earlier days we enjoyed with pleasure and profit the intercourse with our professional brothers of all parts of our country, and as the unhappy feud, which has for four years divided the nation, has now ceased, and peace has again come, we trust forever; so we hope soon again to meet our members and delegates from the South on this platform of fraternization; and to this end we extend to them an earnest invitation and promise them a cordial welcome.

On motion of Dr. A. A. GOULD, of Massachusetts, the following was adopted:—

Resolved, That the Association has been much gratified by the presence of distinguished professional brethren from the neighboring provinces. Science knows no bounds; and we trust that in future sessions the American Medical Association may be favored with similar co-operation in a common cause.

A letter having been read by Dr. H. I. BOWDITCH, of Massachusetts, relative to fears of famine in Georgia, &c., Dr. J. F. HIBBERD, of Indiana, offered the following, which were unanimously adopted:—

Resolved, That this Association has learned with deep regret that there are fears of famine, and consequent disease and pestilence, occurring in some parts of Georgia and South Carolina, passed over by Gen. Sherman's army in its victorious course.

Resolved, That this Association would urge upon the Sanitary

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and Christian Commissions to send agents to learn the exact facts, and, if need be, to take prompt and efficient measures to prevent or mitigate such a distressing result.

On motion of Dr. HIBBERD, of Indiana, a special Committee on Insanity was appointed to report at the next annual meeting of this Association. Committee, Drs. ALFRED HITCHCOCK, of Massachusetts; ISAAC RAY, of Rhode Island; S. H. TEWKSBURY, of Maine; B. FORDYCE BARKER, of New York; and J. S. BUTLER, of Connecticut.

The following resolution offered by Dr. GEO. BURR, of New York, was unanimously adopted:—

Resolved, That the thanks of this Association are eminently due and are hereby cordially tendered to the honorable the General Court of the Commonwealth of Massachusetts for the ample accommodations furnished in the free and unrestricted use of the State House during the several sessions of the Association, also to the city of Boston, for the honorable attention and courteous civilities extended to us through its municipal authorities, the Mayor and Common Council, to the medical profession of the city of Boston for the splendid musical treat provided for us at the Music Hall, to the various public institutions that have generously opened their doors to us, and to the several gentlemen who in a less formal though none the less gratifying manner, have extended their civilities to us, and have added so materially to our enjoyment while sojourning in the city of Boston.

A communication from Dr. ROBERT THOMPSON, of Ohio, Chairman of Committee on Milk-Sickness, explanatory of his failure to report, was read. On motion the Committee was continued for another year.

Dr. HENRY BRONSON, of Connecticut, offered the following resolution, which was unanimously adopted.

Resolved, That the thanks of this Association be and they are hereby tendered to Major John Morrisey, the Sergeant-at-Arms of the Massachusetts Legislature, and his assistants, for the very able and efficient manner in which they have performed the functions of their offices during the sessions of the Association.

On motion, the name of Dr. S. O. ALMY, of Ohio, was withdrawn from the Committee on the Effects of Civilization on the Duration of Life, as presented by the Section on Hygiene, and that of Dr. Z. PITCHER, of Michigan, substituted.

The amendments to the Constitution offered last year, and not

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yet acted upon, were called up by Dr. G. FURMAN, of New York, and were severally indefinitely postponed.

Dr. H. H. CHILDS, Ex-Lieutenant-Governor of Massachusetts, made the following remarks:—

"I feel extremely gratified that I am permitted in behalf of the State Medical Society to be present on this occasion. I have been extremely gratified with the proceedings of the Association, and, permit me to say, very much so as respects the presiding officer, and I would unite in expressing the thanks of the Association for the worthy manner in which he has performed his duties, and hope a reply will be heard from him on this parting occasion."

The President, in reply, addressed the Association as follows:—

"GENTLEMEN: I thought when I was down upon the Island, under that cottage roof, posted upon a chair, that the emotions within me were such as almost to forbid utterance; but I confess, notwithstanding the warm congratulations and cordial feelings which surrounded us there, they have fallen below what you have put upon me to do at the close of this meeting, in the manifestations of your approval of the manner in which I have been permitted to discharge the duties of my office. Compelled by the amendment of the Constitution last year to serve two years in this capacity, I find so warm a manifestation of your approval as surely will never be forgotten by me; and it affords an enjoyment that will leave its impress upon the deepest recesses of my heart, while I am permitted to live, no matter what may be the vicissitudes that await me in the future or changes which may take place in this our national organization. The feelings which have been impressed upon me here will remain unobliterated while time lasts, and I fondly hope will not be wasted while eternity itself shall endure. But, gentlemen, I must, in turn, offer my most cordial thanks to every one of you, for if we have had excellent meetings, it is because you, every one of you, have kindly sustained me in the discharge of my duties, and, therefore, I say, I am as much indebted, and far more than you are to me; therefore I give you my thanks. And I tender my thanks cordially to the city of Boston, and to all those in the vicinity, for the manner in which I, as an humble individual, have been treated. Before I close, let me make one more observation. I have been very strongly impressed for twelve months past with the feeling that this Association had arrived at a crisis of its existence; and that the results of this

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meeting, here in the old cradle of liberty, almost in sight of the waves of the Atlantic, would determine whether this Association was to be perpetuated to the latest generations, gathering the profession from the four quarters of the continent, not merely from East or West, North or South, but from the whole continent, and uniting it in a common brotherhood for defending the interests of humanity as long as civilization itself shall endure, or whether we should culminate, and, like the transient meteor in the heavens, make our mark and fade away. And I felt strongly impressed at the time, because I saw many aged among us, and many young who looked to the aged as their leaders, evidently faltering in their zeal. And it seemed we had arrived exactly at the period when the Association was about to be transferred from our generation to the next, and as I commenced very young I felt that I stood as a connecting link, that my right hand was on the shoulder of the aged and my left upon the shoulder of the younger members of the profession, and if I could hold them together and put the burden of the Association over from the shoulders of the one fairly upon the other, I was sure it would stand firm through all coming time. My brethren of the profession, I feel that the crisis has passed. The Association is established upon the firm shoulders of the next generation. I am sure they will pass it to the next, and along to others as long as civilization shall exist; therefore I cordially sympathize with you in all the enjoyments of this occasion; and I hope while I am permitted to live and be able to go by steamship or rail-car that I will find time to enjoy a green oasis every year, in meeting you as long as age shall let me linger with you."

At the close of the address the members arose and gave three cheers for Dr. Davis.

On motion, the Association adjourned to meet on the first Tuesday in May, 1866, in the city of Baltimore.

W. B. ATKINSON,
Permanent Secretary.
HORATIO R. STORER,
Assistant Secretary.

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REPORT

OF

THE COMMITTEE OF PUBLICATION

AND OF

THE TREASURER.

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REPORT OF THE COMMITTEE OF PUBLICATION.

THE Committee of Publication respectfully report:—

That an edition of seven hundred and fifty copies (750) of the *Transactions* of the last annual meeting was issued by them at an aggregate cost of $2,100.

Of this edition, four hundred and seventy-one (471) copies have been delivered to members, and eleven to various medical journals, leaving two hundred and sixty-eight (268) copies in the possession of the Association.

The items of expenses incurred will be found in the report of the Treasurer.

The following schedule exhibits the number of copies of each volume now possessed by the Association.

Vol. I. Out of print (5 copies held by the Association).	
Vol. II.	6 copies.
Vol. III. and IV. Out of print.	
Vol. V.	222 "
Vol. VI. Out of print.	
Vol. VII.	30 "
Vol. VIII.	187 "
Vol. IX.	215 "
Vol. X.	129 "
Vol. XI.	148 "
Vol. XII.	234 "
Vol. XIII.	111 "
Vol. XIV.	195 "
Vol. XV.	268 "

There has been received since last report, 1 copy of Vol. II., and there have been sold and delivered 6 copies of Vol. V.; 5 copies of Vols. VII., VIII., and IX.; 4 of Vols. X., XI., and XII.; 5 of Vol. XIII., and 49 of Vol. XIV. Of the proceedings of the first meet-

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ing held at Philadelphia, there remain on hand 31 copies, 4 having been sold since the last report.

The Committee desire to call the attention of the Association to the great expense of printing and illustrating their *Transactions*, arising from the high price of material and labor, and they respectfully ask for the passage of the following resolutions:—

Resolved, That the Committee of Publication be, and hereby is, authorized to invite each member to contribute such additional sum as will enable them to defray the expense of publishing the forthcoming volume, *provided*, that the amount in the hands of the Treasurer shall prove to be insufficient for that purpose.

Resolved, That the sum of one hundred dollars be appropriated for the purchase of the dies from which the prize medal was struck, and that they be committed to the Treasurer as the property of the Association.

All of which is respectfully submitted.

FRANCIS G. SMITH, JR., *Ch'n*,
H. F. ASKEW,
WM. B. ATKINSON.

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TREASURER'S REPORT.

THE Treasurer has the honor to report:—

That the Committee of Publication have been able to issue Volume XV. of the *Transactions*, owing alone to its small size and inexpensive character; had it reached the usual dimensions, the meagre funds of the treasury would not have sufficed for its publication.

The receipt from delegates in New York, in round numbers, was $1,600, and the balance from the previous year $450, making $2,050. The volume with the Prize Essay and other necessary expenses reached $2,100. There is now a surplus of $300 in the Treasury after the publication of this smallest and most inexpensive volume.

Exertions for the sale of the said volume have been made in the most important cities of the Union by prominent resident members of the Association, and circulars have been sent by the Treasurer to all those permanent members who have heretofore been in the habit of subscribing, while announcement has been made of the appearance of the volume in the medical journals throughout the land. All this has resulted in the purchase of the book by about eighty-five Permanent Members out of a society of about three thousand. The members of the American Medical Association do not consider the volume of *Transactions* worth the cost of production.

This Association must either furnish material that the profession is willing to purchase at the cost of printing, or so abridge the material which it receives, as to enable the Treasury to pay for its publication. Otherwise a volume of *Transactions* for the year 1865 will owe its appearance, as did that of 1864, mainly to the absence of the reports of regularly constituted committees.

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The American Medical Association

Dr.

June 1, 1865.	
To cash balance from B. C. 1863 and 1864 . . .	$449 02
" " received from delegates New York . . .	1,614 00
" " " " permanent members . . .	340 00
	$2,403 02
To balance on hand	$301 95

CASPAR WISTER,
Treasurer.

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in account with Caspar Wister, Treasurer.

		Cr.
By cash paid	postage on papers	30
" " "	postage on Volume of Constitution	$1 10
" " "	B. F. Waitt, drawing and engraving on wood	28 50
" " "	Cushing & Bailey, for printing memorial for C. C. Cox, M.D.	25 00
" " "	B. F. Waitt, drawing and engraving on wood	44 00
" " "	T. K. Collins, for printing and binding 750 copies, Vol. XV. Transactions, circulars, postage, &c., less 5 per cent.	1,572 74
" " "	P. S. Duval & Son, drawing and printing maps and plates, less 5 per cent.	237 50
" " "	H. M. Barnes, for services as clerk	50 00
" " "	J. F. Speir, for prize essay	100 00
" " "	Blanchard & Lea, for expenses of delivery of Vol. XV.	28 55
" " "	Expenses Permanent Secretary	9 47
" " "	Expenses of Treasurer	3 91
" balance on hand		301 95
		$2,403 02

Audited and found correct.

F. G. SMITH,
Chair. of Com. of Pub.
WM. B. ATKINSON.

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ADDRESS

OF

N. S. DAVIS,

PRESIDENT OF THE ASSOCIATION

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ADDRESS OF N. S. DAVIS,

PRESIDENT OF THE ASSOCIATION.

GENTLEMEN OF THE AMERICAN MEDICAL ASSOCIATION:—

In entering upon the discharge of those duties imposed on me by your too generous partiality, one short year since, I was constrained to do it with expressions of deep regret, that the great struggle for subduing a gigantic rebellion was still continuing; and that in consequence, the seats of many of our professional brethren whose cordial hands and warm hearts had so often greeted us, were still vacant. Those expressions of regret were accompanied by the hope, that, before the day for this annual gathering would come, the dark and desolating cloud of war would be broken, and give place to the radiant bow of peace, with former friendships restored and our National Union unbroken. It is my highest pleasure to congratulate you, to-day, that what we then so fondly hoped for, is now substantially accomplished. The cherished *flag* of our country again waves in triumph over every part of our almost boundless domain; and the patriotic legions who have borne it proudly, on so many bloody fields of human strife, are returning to their peaceful firesides, decorated with wreaths of victory and enshrined in a nation's gratitude.

But our congratulations, to-day, are still mingled with a deep shade of sadness. Sadness, that so many of our countrymen have been compelled to sacrifice their lives in defence of the integrity and perpetuity of our government. Sadness, that so many of our professional brethren have been constrained to abandon the peaceful pursuit of their humane calling at home, and sacrifice comfort, health, and, sometimes, life, in the noble effort to mitigate the calamities and sufferings of war. And a deeper, more enduring sadness, that to the desperate wickedness of treason, has been added

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the darkest crime that can disgrace human nature, the deliberate murder of the Chief Magistrate of this great Republic. Let us hope, however, that in this act, the climax of human wickedness has been reached; that the cup of our national calamities has been drunk to its bitterest dregs; and with becoming humility, in the true spirit of our humane calling, let us implore the Sovereign Ruler of the Universe to make our reunion one of hearts as well as States; and our great nation, one in which labor shall everywhere receive its just reward, whether in the workshops and humble cottages of the North, or on the sunny plantations of the South.

By a natural transition, the mind turns from these reflections to the work of death in our own ranks, since our last annual interchange of greetings. A few months since, one who has filled the highest position in the gift of this Association with unrivalled ability, and whose professional skill, ripe scholarship, and noble Christian deportment had endeared him to us all, was called upon to cease his earthly toil and enter upon a higher and a holier existence.

And at the very hour when our profession was bowed in full sympathy with the national grief for the loss of its Chief Magistrate, our cup of affliction was made to overflow afresh by the final departure of one who, by universal consent, had occupied for many years the highest position, especially in the surgical department of our profession, not only in America but throughout the civilized world. Need I mention the names of Jonathan Knight, of New Haven, and Valentine Mott, of New York?

After long lives, ardently and successfully devoted to the dearest interests of humanity, full of years and full of honors, peacefully they have gone to their eternal rest. But their names, their works, and their noble examples are left to us and the generations that will follow. Nor has the work of the destroyer been limited to these; for within a few months past Thos. D. Mitchell, of Philadelphia; William E. Coale, of Boston; and Sylvester D. Willard, of Albany—all members of this Association, and eminent in the profession—have been released from their earthly labors.

With this slight and imperfect tribute to the memory of those whom we shall see no more in our midst, permit me to occupy your attention with some reflections upon the past history, present organization, and future prospects of this great National Medical Association. In submitting these reflections, I shall assume

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neither the character of an eulogist nor a critic, but shall simply endeavor to draw such lessons from the actual results of the past, as will aid in the discharge of the duties of the present, that still greater benefits may be reaped in the future.

Twenty years have now elapsed since the Medical Society of the State of New York issued the call for the National Convention from which our present Association had its direct origin. During that period of time, large, pleasant, and harmonious meetings have been held in almost every section of our widely extended country; and both time and opportunity have been offered for developing the actual interests and influences involved in our organization. It requires only a brief examination of our past career, to show that both in the principles of our organization, and in the practical results of our annual meetings, three important interests are directly involved, namely, the improvement of our system of medical education; the direct advancement of medical science and practice; and the promotion of social intercourse and fraternal feeling throughout the entire profession.

And the thoughtful attendant upon our meetings has not failed to observe, that each of these interests has uniformly attracted a due share of representatives. Indeed, most of the embarrassments attendant upon our past meetings, and the criticisms to which the Association has been subjected, have arisen from the difficulty of accommodating interests so important and varied, in such a manner as to satisfy the advocates of each, in the very brief time hitherto allotted to our annual meetings. Thus, whenever medical education became the theme of discussion, those more interested in the reading and discussion of papers and reports of a direct scientific and practical character, were ever ready to restrict debate, refer the subject to committees, or in some other way avoid what they regarded as a mere waste of time. On the other hand, if the reading of an elaborate scientific paper was commenced, the author would seldom complete the first half dozen pages before the zealous advocate of educational reform would dispose of the whole subject by a motion to dispense with further reading, and to refer the document directly to the Committee of Publication. While the good natured lovers of good dinners and sight-seeing would always be ready to aid the other parties with their votes, and to secure the acceptance of every invitation to an entertainment, an excursion, or a public institution.

Under such circumstances, our records soon became cumbered

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with a multitude of reports and resolutions concerning medical education, and the annual volume of *Transactions* plethoric with reports and papers that were read to the Association by their titles only; while the social entertainments reached a magnificence and costliness seldom equalled in any other relation of society.

The embarrassments felt from these circumstances led to frequent propositions to change either the Constitution of the Association or its rules of business.

To avoid lengthy reports on general topics, all the standing committees on the different departments of medical science were first abolished, and a list of committees on special subjects substituted in their place.

To further economize time, an order was next adopted, requiring every report and paper covering more than ten pages of manuscript, to be presented by a brief abstract merely setting forth its title and contents.

To check the evils of extravagant and costly entertainments, the Committee of Arrangements were instructed to omit all such from the programme of arrangements for all subsequent annual meetings.

The practical results of these changes were by no means satisfactory. The first led to the annual appointment of a long list of committees on special subjects, not one in six of whom ever furnished a report of any kind. The second speedily developed the practice of presenting reports and papers by their titles only, and often accompanied by the acknowledgment that they were still unfinished, followed by a vote that they be referred directly to the Committee of Publication. Thus, in many instances, not only deciding to publish papers of which the Association was profoundly ignorant, but which, at the time, had no actual existence except in the minds and memoranda of the authors.

The adoption of the third, judiciously designed to check extravagance in social entertainments, has resulted only in exchanging one magnificent public banquet occupying one evening, for three or four private ones every evening during the annual sessions of the Association. If we add to these considerations the fact that the greater part of the first day of each annual session, embracing one fourth part of the whole time, has been occupied with preliminary matters of organization, and the election of officers who were immediately required to enter upon the performance of duties for which they were often wholly unprepared, we shall readily perceive the reasons why the practical working of the Association, thus far, has

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not fully realized the wishes and expectations of many who have labored efficiently for its organization and support.

Some, who entered upon the work with the hope that the Association would be the agency for speedily securing the adoption of a uniform and elevated standard of medical education by all the medical schools of our country, and having in their own minds some favorite plan by which it was to be accomplished, having seen year after year pass without its adoption, very naturally conclude, from their standpoint of observation, that the Association is a failure.

Others, who entered with equal zeal upon the work of organization, with the hope that it would be the means of establishing in the profession of our country, a spirit of original scientific investigation, a more complete elucidation of the causes and laws governing the prevalence of zymotic and epidemic diseases, and a higher standard of medical literature, have found in our short annual sessions and the little attention actually given to scientific and original papers, comparatively little to sustain their zeal, or to deter them from writing over our portals the word *failure*.

Therefore, it is not strange that we should meet here and there an unfriendly criticism, or the uncomplimentary remark that our annual meetings partake more of the character of "gormandizing and sight-seeing," than of grave scientific and professional inquiry; or, in casting our eyes over the assemblages of the last three or four years, we should miss the presence of some who contributed so much to the interest and value of all our earlier meetings. But with a frank admission of the defects and embarrassments in the past practical working of this Association, does the conclusion legitimately follow that it has made so little progress in the accomplishment of the important purposes for which it was organized, as to demonstrate its inutility, or to create a well-founded doubt of its ultimate entire success?

To answer this question without prejudice, it is necessary to keep in mind the distinction between the accomplishment of a given purpose, and the particular modes or plans by which it is to be attained. Many of the latter may be tried and fail, and the object sought may, nevertheless, be fully accomplished. It is probable that three-fourths of those who originally looked confidently to this Association as the instrument for elevating the standard of medical education in this country, entertained the idea that it would be effected by some uniform plan, embracing better preliminary education, longer lecture terms, more extensive clinical instruction,

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and more rigid examinations, to be formally adopted by the Schools. And inasmuch as no such *plan* has yet been adopted, it is quite natural that those, who had been regarding this as the only method for gaining their purpose, should regard the purpose itself as a failure. And yet such an inference would neither be a logical deduction from the premises, nor in accordance with the actual facts as they exist at the present time.

This will be fully apparent to any one who will compare the number, location, and requirements of the medical schools of 1845 with those of 1865. At the former period from thirteen to sixteen weeks was almost universally adopted as the length of the annual lecture term.

Now, the number of the Colleges in which the lecture term is less than eighteen weeks are few and unimportant, while some have extended it to five, and others to six months. Then, the number of chairs or professorships was five and six, leaving the important branches of Organic Chemistry, Microscopic Anatomy, and General Pathology entirely out, and usually making Physiology only an appendage to the chair of Anatomy.

Now, the medical college that does not include all these in its curriculum would be universally considered as behind the age. At the former period three-fourths of all the medical schools in this country were so located that their students could have no access, whatever, to any true clinical instruction at the bedside of the sick. And in those located at Boston, New York, Philadelphia, Cincinnati, and New Orleans, where adequate hospitals existed, the actual clinical instruction was generally limited to one or two visits to the hospitals each week. Now, this is so far reversed, that two-thirds of the whole number of our medical colleges provide some amount of true hospital clinical instruction, and three of them, at least, are so directly connected with important public hospitals that their courses of clinical instruction, in all the departments of practical medicine and surgery, are as full and extensive as in any of the other departments of medical science.

The extent and importance of the change, in regard to clinical instruction, will be rendered still more apparent by another mode of comparison. For instance, at the time of the organization of this Association, not only three-fourths of our medical schools were so located as to afford their students no access to hospitals, but a large majority of the whole number of students resorted to them for instruction. Thus, in the New England States, there were at

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least, six medical schools, of which only the one in Boston was located within reach of an adequate hospital; and yet its classes were often outnumbered by those at Pittsfield. While at the present time, if I remember correctly, the number of students receiving instruction in Boston with access to the Massachusetts General Hospital is nearly, if not quite, equal to that in all the other New England schools put together. The time is fresh in my memory when the number of students annually assembled in a medical college located on the bleak hills of Herkimer County, in the State of New York, fully equalled those resorting to the schools directly in the great Metropolis of that State. Now I think there is not a medical college maintaining an active existence in that State, which does not provide for its students access to a public hospital for clinical instruction.

What is true of New England and New York, in this respect, is equally true of the whole country.

When we remember, that of all the improvements in medical education demanded by this Association from its primary organization to the present time, none were more prominent, clearly defined, or more persistently urged, than an increase in the number of professorships, with an extension of the curriculum; a lengthening of the annual lecture term; and the addition of full hospital clinical instruction, both in practical medicine and surgery, we see how closely the improvements actually made correspond with the demands of the Association, and how nearly the objects sought have been already accomplished.

It is true that they have not been accomplished by the formal adoption of any particular plan or concert of action, and perhaps not wholly through the influence of this Association. But that their accomplishment has resulted mainly from the strong concentration and persistent expression of public sentiment through this Association, there can be no reasonable doubt.

Neither has the influence of our organization upon the progress of medical science and literature been as feeble as many suppose. At the commencement of our associate existence, the number of original American medical works was comparatively small; and the universal complaint was, not only that American talent was spent only in the editing of foreign books, but that our own writers, even of the highest reputation, found it extremely difficult to find publishing houses willing to issue their works from the press. The able reports on this subject and on medical literature, made to the

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earlier meetings of this Association, and the consequent general awakening of attention to it throughout the whole profession, has resulted in so completely reversing the former state, that we now rarely see the name of an American writer appended, merely as an editor of a foreign work; while the medical press of our country literally teems with original medical works of high merit in every department of medical science. And not only so, but the shelves of the laborious practitioners of our humane art, throughout the whole country, now contain three American to one foreign work, especially in the departments of practical medicine, surgery, and obstetrics. And whoever examines the series of published transactions of the Association will not only find a number of essays which, for scientific merit, would do credit to the investigations of any other country, but they will find much additional evidence that attention has been directed to most important inquiries concerning the causes and prevalence of epidemic diseases; the influences of topography and climate on endemics; and the nature and therapeutic value of indigenous articles of the materia medica, not only among our own members, but also throughout many of the State, county, and district medical societies in every part of the country.

Socially, the success of our organization has been all that the most ardent could desire. It has not only removed local prejudices and sectional jealousies, but it has awakened everywhere the most liberal hospitality, and the most cordial friendships. It has, indeed, made neighbors and friends of families whose homes are a thousand miles apart; while it has infused new life into many old State and local societies, and stimulated the profession to the formation of many new ones.

From a deliberate and candid examination of the whole past history of the Association, with a full appreciation of the embarrassments arising from short annual sessions and imperfect arrangements for the transaction of business, I am fully satisfied that, so far from having proved a failure, it has made such substantial progress in the accomplishment of every important object of its creation, as to afford the fullest assurance of its final complete success. Hence, instead of entertaining doubts, or yielding to feelings of hesitation or discouragement, every friend of the social organization of the profession, and every advocate of advancement in its educational, scientific, and literary interests, should give it his most cordial support. Instead of abandoning the work of twenty years past, merely because it is not yet perfect, true wisdom would dictate the

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careful removal of such hindrances and imperfections as time and experience have developed, that the great and important work itself might be pushed more rapidly to completion.

Having carefully and anxiously watched the progress of this Association, from the incipient steps of its organization to the present time, I trust those assembled on this occasion will pardon me, if I devote the remainder of this address to a brief and explicit statement of those measures which seem to me sufficient, if judiciously executed, to insure its complete success and perpetuity.

Although it is apparent that most of the evils and embarrassments, which have attended our past meetings, have arisen from an attempt to crowd a consideration of the educational, scientific, and social interests of the profession into the short space of three or four days, yet it is by no means desirable to abandon either of these interests in the future. The exact and all important desideratum needed at this stage of our progress is such an apportionment of time to each of these interests as its relative importance demands; and the time allotted to each so systematically used as to develop the highest degree of efficiency in the results. To have a time and place for each legitimate interest, and to keep each in its place, is a matter of paramount importance in an organization so extensive as ours. Happily the arrangement for attending to the scientific interests of the Association in sections, first carried into effect in 1860, and the amendments to the Constitution adopted in 1864, have removed all impediments to the adoption of a most complete and efficient plan of operations at each annual meeting. Let the morning sessions, of moderate length, be devoted to the general business of the Association and the consideration of all matters relating to medical education, together with the simple presentation of all scientific reports and papers by their titles, that each may be referred to the section most appropriate for its consideration. Let all the afternoons and evenings, except one evening of each session, be set apart exclusively for the consideration of the scientific interests of the Association in the capacity of sections. This would leave only the one evening of each session to be devoted, in a formal manner, to purely social interests. To some, this limited time may seem insufficient. But if we remember that all such, as are more interested in sight-seeing and mere social intercourse than in the advancement of science and literature, can gratify their preferences at any part of the meeting without interrupting either the general sessions or the sections, it will be conceded that the time

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specified is quite as much as the *relative* importance of the interest to be served requires.

But the arrangements for that evening should be such as would permit the most free and cordial intercourse. A public hall should be provided in which gentlemen and ladies could mingle and promenade freely; where each could seek out his old friends and make the acquaintance of new ones; where wit, repartee, and, if need be, songs, sentiments, and speeches could be made to enliven the evening. A simple stand might be placed in some corner, where all who wished could obtain a dish of ice cream, strawberries or other fruit, and a cup of coffee. But there should be neither ostentatious show, nor rich viands, nor strong drinks, for the acknowledged guardians of the public health should not, especially in their highest representative capacity, themselves publicly violate the plainest laws of hygiene.

That part of our proceedings which has been the subject of most serious complaint, during the last few years, has related to the consideration and final disposition of such reports and papers as related to the scientific and practical interests of the profession. And it may appear to many that the time which has been indicated as proper to devote to those topics is still wholly inadequate for their proper examination and disposition.

If, however, all such papers and reports are called for and referred to the appropriate sections, before the close of the first morning session, as they certainly should be, it is confidently believed that adequate attention could be secured for every subject properly presented for consideration. If the order of business is so arranged as to accomplish this, the several sections can commence their work on the afternoon of the first day of each annual meeting, thereby securing from three to four full afternoons and evenings for their important work; and if all the sections are properly organized and the subjects for consideration judiciously distributed among them, it will be equivalent in practice to a multiplication of these three or four afternoons and evenings by six, or a practical extension of the time devoted to the scientific interest of the Association to three or four weeks.

And in this connection I wish to call your serious attention to the more complete and efficient organization of these subdivisions of the Association. As each section is authorized to choose its own officers and adopt its own rules of action, their existence should by no means be regarded as ended at the adjournment of each annual

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session. But a President and thoroughly qualified Secretary should be chosen for the entire year, and each section should adopt a system of well-considered rules which should govern the reading, discussion, and final disposition of all reports, papers, and questions that legitimately come before it. Among the rules thus adopted should be one requiring every report and paper to be so far complete, at the time of its presentation, that if deemed worthy of publication it can be passed from the custody of the section directly to the Permanent Secretary, without being detained by the author for either revision or completion. Another should peremptorily forbid the reference of any report or paper on a scientific or practical subject, to the Committee of Publication, until the same shall have been sufficiently examined by the section to know its length, its actual contents, and the number and character of the illustrations, if any, that are to accompany it. If there should happen to be more papers referred to any one section than could be fairly examined during the time the Association is in session, such surplus papers should be referred to judiciously selected sub-committees, with instructions to complete their examination and report on the same to the Permanent Secretary within thirty days after the adjournment.

The adoption of such rules, and the rigid adherence of each section to them, would accomplish two very important objects. First, it would more effectually guard against burdening the Association with the publication of matters appropriate only for the pages of an ordinary medical periodical, and would secure the Committee of Publication against unnecessary delays in the reception of such matter as should be actually designed for publication in the *Transactions* of each year. Second, by rendering it certain that every report or paper properly prepared, and presented in time, would receive a fair hearing and consideration, a very much larger number of writers and investigators of ability would be induced, annually, to present the products of their labor for the consideration of the Association.

Permit me to make one more suggestion in relation to the sections, namely, that each section should be provided with either a skilful secretary or a professional reporter, who, in addition to the simple record of proceedings, should preserve a correct summary of all discussions on scientific questions and papers, and report the same to the Permanent Secretary, that so much of it as shall be of importance, may be published in connection with the papers to which it might relate, in the *Transactions* of the Association. This would

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not only preserve many valuable facts and observations in a small compass, but it would present a strong additional inducement for the most active and experienced minds in the profession, to attend and participate in the doings of the sections.

I hope the foregoing suggestions will be regarded as worthy of a prompt and careful consideration by the several sections at our present session.

I would also suggest to the Association the propriety of dispensing with the appointment of a long list of special committees annually, which seems to have served little other purpose than to advertise the names of those receiving the appointment; and, instead thereof, allow each section annually to select such subjects for investigation, and appoint such committees to investigate them, as they may deem most profitable. This need not interfere in the least with the reception of voluntary communications on any subject in the same manner as at present; and yet I am confident it would insure the selection of more important topics, cause them to be more equally distributed among all the important branches of medical science, and secure their more prompt and thorough investigation.

It should be a leading object of the scientific department of our Association to awaken and foster in the profession an active spirit of experimental research and of rigid deductive investigation. It should also exert an important influence in directing such researches into the most profitable channels, by more carefully selecting the most appropriate topics for investigation from year to year.

If each section, now provided for by our by-laws, would perfect its organization, and designate two or three important topics for investigation the coming year, it is certain that it would give to the scientific interests of this Association a scope and efficiency far superior to the present or any previous methods of procedure. It has also appeared to me that such a change might be made in the mode of disposing of the papers presented to this Association as would liberally encourage contributions and yet greatly increase the scientific character of our annual volume of *Transactions*. According to my views the volume of *Transactions* published to the world, by such an association as this, should contain no papers except such as embody a complete deductive review of the topics discussed, developing and establishing important rules of practice; or the results of such well-devised series of experiments or observations as clearly indicate a positive addition to our stock of knowledge

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concerning some one of the departments of medical science. Such papers and reports as might be presented and referred to the several sections, which though neither complete as deductive essays, nor clearly establishing new facts, yet containing fragmentary items or cases of value, or suggestions worthy of further investigation, should be recommended for publication in such regular medical periodicals as their authors might choose; while such only as were found worthless should be returned to their authors.

It might be feared by some, that the adoption of such a rule of proceeding would make our annual volume of *Transactions* very small. Be it so. It certainly is not the *bulk* of the volume, but the *quality* of the matter it contains, which is to affect both our reputation and our usefulness. Perhaps one of the most important topics connected with medical science, which still needs elucidation, is the connection of atmospheric conditions with the prevalence of certain forms of disease. But to properly investigate that subject, it is absolutely necessary to have a perfectly reliable register of the thermometric, barometric, hygrometric, electric, and ozonic conditions of the atmosphere, kept in each important geographical section of our country through a series of at least ten consecutive years, in direct connection with a corresponding record of the prevalence of the various forms of disease in the same localities. And I suggest whether, if the rule just mentioned in regard to the publication of papers in the *Transactions* should so far diminish the size of the annual volume as to leave a surplus in the treasury, it would not be far more profitably spent in furnishing the necessary instruments and establishing the necessary records, to determine with accuracy, in a few years, the actual relations of appreciable atmospheric conditions to the prevalence and character of diseases than in the publication of such papers as serve little other purpose than to increase the size of the volume of *Transactions*. Indeed, if capable and zealous members of the profession, furnished with the necessary instruments, could be employed in each section of the country, and the results of their observations carefully arranged, tabulated, and reported to this Association annually; where, in the section on meteorology and epidemics, those results could be closely scanned, and have added to them the more desultory observations of the profession generally, it could not fail to throw a flood of light upon the etiology of a large class of most important diseases.

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With becoming deference I submit the foregoing suggestions for your consideration. They contemplate no changes in our Constitution or plan of organization; they propose the introduction of no new or untried schemes; but they have for their sole object the removal of obstructions and objections, which the experience of the past has demonstrated to exist, and the development of a more complete, systematic, and efficient method of transacting all the important business of the Association.

The great object is to perfect and perpetuate, what has been already so well begun.

This great *National Medical Organization* has already existed long enough to have passed the dangers and uncertainties of its childhood, as well as the fickleness of its youth. It is time that its principles, its modes of action, and its important objects, were clearly defined, methodically arranged, and matured to the steadiness and vigor of early manhood. Many of the most renowned members of our profession, who took part in its organization and watched over its earlier years, have been gathered to the home of their fathers; and the nineteen years of active toil that have been added to the lives of many others have carried them beyond the period of ardent active labor, to the more quiet era of ripening age. They still mingle with us, and, at each returning anniversary meeting, we hail their presence and crave their counsel with the same joy and reverence that characterize the meeting of the filial son and virtuous father.

But the important question, whether this Association, which has already accomplished so much for the advancement of the educational, scientific, and social interests of our noble profession, and maintained a vigorous and *unsullied* career during the *nineteen* eventful years that are passed, shall be maintained, its modes of action perfected, and its beneficial influences constantly extended, depends entirely upon the generation who are now in the active, vigorous period of early manhood. If those of this class, whom I now see before me, have imbibed the spirit of the founders of this Association, and will come forward with alacrity to the work of sustaining and perfecting what their fathers in the profession have begun, its existence will not only be perpetuated from generation to generation, but its beneficent influences will widen and deepen with every returning anniversary. Candor compels me to admonish you, however, that such a result can never be accomplished by any amount, either of good *wishes* or *fault-finding;* but by prompt, per-

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severing, disinterested action. Let all those who desire to see the standard of medical education steadily elevated from year to year, continue to concentrate, and give expression to public sentiment through the morning session of each anniversary meeting. Let all those who have been complaining for years past, that sufficient attention has not been given by the Association to scientific matters, appear promptly in the several section rooms this afternoon, and aid in organizing and putting into efficient operation each of those subdivisions of our organization. The very complaints and criticisms, in which you have heretofore indulged, have demonstrated your appreciation of the work to be accomplished. Hence I feel the more freedom in cordially inviting you to an active participation in the work.

If the generation, into whose hands are now passing the labors, the honors, and the responsibilities of our time-honored and most beneficent profession, will give faithful heed to these things, the American Medical Association will not only outlive whatever changes and convulsions may be in store for our loved country in the future, but its members will annually come up from the North, the South, the East, and the West, to sit in social harmony, and plan additional means for alleviating human suffering, so long as civilization itself shall continue to bless the tribes of earth. Finally, let us all remember, not only while transacting the business of this annual session, but also in all the work that is before us in the future, that the great object of a virtuous and happy life is neither worldly honors nor worldly treasures, but an inward consciousness of doing *good* from day to day.

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REPORT OF THE SECTION

ON

Practical Medicine and Obstetrics.

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REPORT OF THE SECTION

ON

PRACTICAL MEDICINE AND OBSTETRICS.

MINUTES OF THE CONCLUDING SESSION OF LAST YEAR.

THE Section was called to order at 8½ o'clock on Thursday evening, June 9, 1864, by the Chairman, Prof. BARKER, of New York. In the absence of the Secretary, Dr. ELSBERG, of New York, was elected Secretary *pro tem.*

Dr. A. FISHER, of Illinois, read his paper on the *Sulphites of Lime and Soda in the Treatment of Hospital Gangrene, Phlebitis, Erysipelas, and other Zymotic Diseases*, which was, on Dr. GARDNER'S motion, referred for publication.

Dr. McGUGIN, of Iowa, briefly stated his views on *Puerperal Tetanus.*

Dr. PALMER, of Michigan, related a case of a lady who, when near the termination of her pregnancy, was thrown by a horse upon a plough, a projecting portion of which entered near the urethra, separating the various muscular attachments; the child came out through the opening above, and lived for four months.

Dr. ELSBERG, of New York, exhibited some instruments for cutting, by the aid of the laryngoscope, within the larnyx, and entered upon some explanations as to the results he had obtained by their use.

Dr. HITCHCOCK, of Massachusetts, read a paper on a modified ring pessary, which, on Dr. SANDS' motion, was referred to the Committee of Publication.

The Section then adjourned *sine die.*

TUESDAY, JUNE 6th, 1865.

The Section on Practical Medicine and Obstetrics met in the rear of the Senate Chamber, east wing, and was called to order at 3.20 P. M.

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Dr. ZINA PITCHER, of Michigan, was elected Chairman, and Dr. ELLSWORTH ELIOT, of New York, Secretary.

Dr. ELSBERG, of New York, read the minutes of the concluding session of the Section held in 1864, and stated that sickness had prevented him from forwarding the same to the Permanent Secretary, as well as a paper by Dr. A. FISHER, of Illinois, *On the Sulphites of Lime and Soda in the Treatment of Hospital Gangrene, Phlebitis, Erysipelas, and other Zymotic Diseases.* He recommended that Dr. FISHER'S paper should be referred for publication, unless the author wished to revise it, in which case he should be allowed the privilege.

Dr. ELSBERG'S minutes were approved, and his recommendation adopted.

At this time the number in attendance being large, and the room small, the Section adjourned to the Hall of Representatives.

Dr. H. R. STORER, of Massachusetts, read a paper on *Insanity*, omitting some portions thereof.

A motion was made to refer it to the Committee of Publication.

Dr. W. HOOKER, of Connecticut, moved to amend that the Committee omit all matter of a personal character.

Remarks were made by Dr. JARVIS, of Massachusetts, giving statistics tending to show that the positions taken by Dr. STORER were open to question.

In reply, Dr. STORER read the statistical portion of his paper, and disclaimed even the remotest intention of personality.

The amendment of Dr. HOOKER was lost, and the motion to refer carried.

The Secretary commenced reading a paper *On the Relation which Electricity Sustains to the Causes of Disease*, by Dr. S. LITTELL, Emeritus Surgeon Wills Ophthalmic Hospital, Philadelphia, but the hour being late, a motion was carried postponing its further reading, and adjourning to meet at the usual hour, Wednesday, June 7th, 1865.

Estimated number in attendance, about two hundred.

ELLSWORTH ELIOT, Secretary.

HALL OF REPRESENTATIVES,
WEDNESDAY, June 7th, 1865.

The Section on Practical Medicine and Obstetrics was called to order by the Chairman, Dr. PITCHER, at 3.15 P. M.

The minutes of the last meeting were read and approved.

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The Secretary of the Section commenced to read the paper of S. LITTELL, M. D., and after the expiration of more than an hour, a motion was made to suspend its further reading, and it was referred to a committee appointed under the following resolution, offered by Dr. LOOMIS, of Washington, D. C.

Resolved, That a committee of three be appointed to report on "The Relation which the Doctrine of the Correlation and Conservation of Forces bears to the Physiological and Pathological Conditions of the Human System."

On motion, Dr. HOOPER, of Massachusetts, Chairman, at the request of Dr. PITCHER, who had withdrawn from the Section to meet an appointment, named the following persons: Dr. LOOMIS, of Washington, D. C., Dr. JACOBI, of New York, and Dr. LITTELL, of Pennsylvania.

Dr. ELSBERG, of New York, exhibited a case of laryngeal disease.

On motion, Dr. ELSBERG'S paper, descriptive of the case, was referred to the Committee of Publication.

It was resolved, that when the Section adjourns, it adjourn to meet at the call of the Chairman.

The foregoing minutes having been read and approved, the Section adjourned.

Estimated number in attendance, one hundred and forty.

ELLSWORTH ELIOT, Secretary.

HALL OF REPRESENTATIVES,
FRIDAY, June 9th, 1865.

Pursuant to a notice given by the President of the Association at the general meeting of yesterday, the Section of Practical Medicine and Obstetrics convened at 8.30 A. M.

In the absence of Dr. PITCHER., Dr. CATLIN, of Connecticut, was elected Chairman.

The Secretary presented the following resolutions, which were unanimously adopted:—

Resolved, That this Section recommend to the Association the following resolution for adoption:—

Resolved, That the Committee of Publication be requested to adopt such appropriate measures as will insure a speedy and general circulation of the Prize Essay on Abortion, provided this can be done without expense to the Association.

On motion, the Chairman was requested to appoint a committee

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to report, at the next annual meeting, on the progress of Medical Science during the current year.

Dr. JEROME CANDEE SMITH, of New York, Dr. J. P. ORDWAY, of Massachusetts, and Dr. E. M. HUNT, of New Jersey, were appointed said Committee.

Dr. HOLTON, of Vermont, offered a resolution that a committee be appointed by the Chairman to report on Diphtheria as it has prevailed in the United States. The motion was carried and the following Committee appointed: Dr. H. D. HOLTON, of Vermont, Dr. OLIVER D. NORTON, of Ohio, Dr. M. RYERSON, of New Jersey, and Dr. J. S. B. ALLEYNE, of Missouri.

The foregoing minutes having been read and approved, the Section adjourned *sine die*.

ELLSWORTH ELIOT, Secretary.

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REPORT

ON THE

USE OF THE SULPHITES OF LIME AND SODA

IN THE

TREATMENT OF HOSPITAL GANGRENE, PHLEBITIS, ERYSIPELAS, AND OTHER ZYMOTIC DISEASES.

BY

A. FISHER, M. D.,
CHICAGO, ILLINOIS.

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REPORT ON THE USE OF THE SULPHITES OF LIME AND SODA.

[This report was read by Dr. Fisher, and referred for publication, at the meeting of the Association held in New York city in June, 1864, but by mistake it was not received by the Committee of Publication in time to be included in the proceedings of that year, consequently, we publish it with the *Transactions* of the Association for this year.]

At the last meeting of the Association, held in Chicago in June, 1863, I had the honor of reading a paper "On the Use of the Sulphites of Lime and Soda in the Treatment of Hospital Gangrene, Phlebitis, Erysipelas, and other Zymotic Diseases."

As I understood the proceedings of the Convention, the paper was referred to a committee of three, making the author chairman, to report on the use of those agents, at the next meeting of the Association, though the published *Transactions* of the Association say that, "On motion of Dr. Griscom, of New York, the communication was referred to the author, and he was appointed a special committee to report on the use of these agents, at the next meeting of the Association." I shall, therefore, act in accordance with the published *Transactions* as my only alternative.

Although I have not been able to collect a sufficient number of cases to make a satisfactory report on the subject, I beg leave to submit the following, imperfect as it is, with a view of attracting the profession to a trial of these remedies in zymotic diseases; being satisfied in my own mind that they will be found invaluable in the large class of diseases called zymotic, catalytic, or blood-poison.

As a basis for proceedings, I will first give a synopsis of the paper above alluded to, that this report may be *intelligible* to those not present at the reading of that communication.

Case I. I first commenced using the sulphite of soda the forepart of February, 1863, in the case of Mrs. McIntosh. I saw her for

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the first time on January 31st. The left leg was destroyed by sphacelus nearly to the knee. The thigh was much enlarged, and tender along the course of the femoral artery and vein, as high as Poupart's ligament, where it was difficult to feel the pulsation of the artery of the affected limb, whilst the pulsation of the artery at the same point of the sound limb was quite strong; the line of demarcation was perfect, tongue red, smooth, and dry, pulse 120 and weak, bowels loose, and no appetite.

Two days later, February 2d, her condition being about the same, with the assistance of Drs. Wickersham, Heydock, Marguerat, and Smith, I amputated the femur above the knee. There was very little hemorrhage, only three or four small arteries were tied. Not a drop of blood was found in the femoral artery, and it was so contracted and filled with fibrin and pus that we did not ligate it. The vein was also completely plugged with a solid reddish substance, the product of inflammation. The patient was very little depressed by the operation, reaction being fully established in twelve hours. We prescribed morphine to allay pain and irritation, with chlorate of potassa in solution.

4th. The stump much enlarged, measuring twenty-three inches in circumference, hard and very tender in the track of the large vessels; pulse 118, and thready; other symptoms about the same. Prescribed sulphite of soda ʒj in solution every six hours, with turpentine emulsion, and tinct. opii every six hours alternately. These medicines were continued until the 12th, the patient gradually improving under their use, and the swelling and induration of the stump subsiding very much. The emulsion was then omitted, and the tinct. ferri chloridi and strychnia were given every six hours with the sulphite of soda. On the 14th she had an attack of remittent fever, and the sulphite of soda was withheld for two days, and the sulphate of quinine was given in its stead. With that exception the sulphite of soda, tinct. ferri chloridi, and strychnia were continued until the 7th of March, when all medicines were discontinued, and she was convalescent, and the stump nearly healed.

Case II. Mrs. R., who nursed Mrs. McIntosh for two or three weeks after the amputation, having previously enjoyed good health, was suddenly taken with chills, pain in the joints, loss of appetite, with debility. Pulse 110, bowels loose, tongue coated and dry. Diagnosed her case rheumatism, and prescribed tinct. cimicifugæ

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ʒss every four hours, with morphia, if necessary, to relieve pain, which she continued to take for two days with no good effect, but grew worse very fast. Her symptoms at that time, as taken from my notes, were as follows: Countenance sunken and cadaverous; pulse 120, small and quick, tongue dry and coated. Severe pain in the joints, unable to move even the fingers without pain, with a blush of red spots over the joints of the fingers, toes, ankles, and other parts of the body. Bowels loose, moving twelve or fifteen times in the twenty-four hours. Has no appetite and takes no nourishment.

After these symptoms were developed, I had no difficulty in diagnosing it a case of blood-poison, and became satisfied that it originated from the case of Mrs. McIntosh by being confined in the same room with her for so long a time.

I prescribed sulphite of lime ʒj every four hours, with a pill of plumbi acetas and opium as often as necessary to control the discharges of the bowels. These remedies were continued for five days, when the diarrhœa was relieved and the pill omitted. The sulphite of lime was continued in ʒj doses every four hours for nine days longer. After taking the sulphite of lime for one or two days she began to improve, and continued to gain steadily until she was convalescent, fourteen days from the time she began to take the sulphite of lime.

Case III. Mr. R., the husband of the lady whose case I have just related, a temperate, robust man, forty years old, received an injury of the ankle and a slight cut on the patella, February 20th, whilst Mrs. R. was sick. In two or three days after, phlegmonous erysipelas commenced in the wound and soon extended to the hip on the anterior and external side of the limb. In a few days there were evident signs of fluctuation. I made an opening in the popliteal region and let out about a pint of pus. During the formation of the abscess, there were no severe constitutional symptoms, and I prescribed no medicines, and when the abscess was opened the patient appeared to be entirely relieved. However, in a few days erysipelas began to show itself again about the hip, with signs of another abscess. Pulse 100, small and quick, tongue coated and dry, no appetite, with severe pain about the hip.

I prescribed sulphite of lime ʒj every four hours, with a poultice over the inflamed part. In less than twenty-four hours, he began to improve, and in a few days he was entirely relieved of the con-

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stitutional symptoms, as well as of the local inflammation, by continuing the first prescription.

In the first case, that of Mrs. McIntosh, there is no positive evidence that the sulphite of soda was the curative agent; for other remedies were given at the same time. But in the case of Mrs. R. I think all will admit that when we first commenced with the sulphite of lime, her symptoms were grave and such as are not relieved, solely, by the *vis medicatrix naturæ*, and that the sulphite of lime produced the desired change in the constitutional symptoms, and consequently was the means of restoring her to health. For no other medicines were given with the exception of the pill of acetate of lead and opium for the diarrhœa, and that was discontinued when the bowels were controlled, and she still continued to improve, when the pill was omitted.

The case of Mr. R. was also in point. He took the sulphite of lime, and nothing else in the form of medicine, and his recovery was rapid and permanent.

I have merely given a synopsis of these cases as they have been reported in an article which I read before the Chicago Medical Society, March 27th, 1863, detailing the symptoms and treatment in full from my notes, carefully taken at each visit. By a vote of the Society that paper was published in the March and April Number of the *Chicago Medical Examiner* of 1863, entitled: "A Case of Amputation of the Femur, for Mortification of the Leg, with two cases of Catalytic Disease treated with the Sulphites of Soda and Lime."

Being the first to prescribe these remedies in catalytic or blood poison diseases, so far as my knowledge extends, in justice to others I will again state how I first came to use them.

My attention was first directed to their use in these cases, by reading the review of an article "On Diseases Depending upon Morbific Fermentation, and their Treatment," by Dr. G. Polli, of Milan, published in part 46 of *Braithwaite's Retrospect*, and taken from the *Dublin Quarterly Journal*, May, 1862, page 367.

From the well-known power of sulphurous acid in preventing fermentation and decomposition of organic substances, Dr. Polli made numerous experiments on living dogs, with the view of ascertaining whether sulphurous acid in combination with alkalies, or alkaline earths, might not be introduced into the system without being changed into sulphuric acid or the sulphates, and if so,

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whether they would not act beneficially in preventing or curing catalytic diseases, or those diseases supposed to be caused by morbific ferments or blood poisoning. His experiments were 68 in number, and they appear to have been conducted with great care.

With a view of determining the quantity of the sulphites of soda, potassa, lime, or magnesia, that could be safely administered to a dog, he gave to one weighing eight kilogrammes ten grammes of these salts daily for fifteen successive days, and afterwards he gave to a dog, of about the same weight, fifteen grammes at a dose. During these experiments he killed several of these dogs, and upon examination found the stomach and intestines in a perfectly normal condition. He then experimented to ascertain whether they were conveyed through the system in the form of sulphites. He gave the sulphite of soda to one dog, the sulphite of magnesia to another, and to the third he gave the same food, but no sulphites. The dogs were put to death at the same time. In the first two, the sulphites were detected in the urine, blood, and every part of the system; in the third, no trace of sulphurous acid could be found; showing that large quantities of the sulphites can be administered without producing any deleterious effects, and that they remain in the system for some time without being changed into sulphates.

After injecting pus and other putrid substances into the femoral veins of dogs, he says: "Experiments carefully practised on animals have given the following results.

"1st. That the injection of a certain quantity of pus into the circulation produces pyemia and such diseases as are characterized by multiple abscesses.

"2d. That the injection of putrid matter produces septicæmia, or those diseases recognized by the name of putrid infections, which are characterized by typhoid gastro-enteritis.

"3d. That the injection of matter obtained from contagious diseases, glanders, for instance, will reproduce the same affections."

After relating numerous experiments of giving dogs the sulphites of soda, lime, &c., and then injecting pus and putrid substances into their veins, the reviewer says: "Several dogs were prepared with different quantities of sulphites for several days previous to being injected with putrid pus; the result was, that those which had received the smaller doses of sulphites died, while those which had been liberally supplied with them recovered, and the rule seemed to be pretty constant, that the more pus was injected, the greater quantity of sulphites was required to antagonize it. Several dogs

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were injected with putrid blood; they all, with one exception, died; other dogs prepared with the sulphites, and then injected with the same blood, all recovered, as well as some dogs that were injected with putrid blood, diluted with twice its bulk of a solution of bisulphite of soda. A number of dogs were similarly treated with the discharge collected from a glandered horse, and the result was the same."

The reviewer further says: "In conclusion we would say, that if the author has not deceived himself in his experiments, nor overrated the value of these substances, but has really discovered in the sulphites a remedy for catalytic diseases, and a prophylactic against them, he has conferred a boon as great, or perhaps even greater, than did Jenner, by his discovery of vaccination."

After carefully reading the review of the article by Dr. Polli, I concluded that the sulphites might be given to patients laboring under zymotic diseases without the fear of doing harm, with the well-grounded hope that they would be invaluable in the large class of diseases called catalytic.

Although Dr. Polli does not say that he ever administered the sulphites to a human being, or the quantity that should be given to a patient, I infer, however, from the article, that he had the idea in contemplation.

I am far from being the first to prescribe new remedies, generally preferring to let those who can experiment on a large scale ascertain their true value before using them; but the case of Mrs. McIntosh was so much in point, and having little confidence in known remedies, I concluded to try the sulphite of soda in her case, and carefully watch its effects. The results in her case and the two following were so satisfactory, that I have since continued to prescribe the sulphites in numerous zymotic diseases with good success, as the following cases will show.

In a room where I was treating Mr. Dunn for erysipelas of the head and face, in April, 1863, his child, a girl about three years old, was taken with scarlatina, the rash appearing on the face, body, and extremities, of a dark or purplish color. At the same time erysipelas appeared on the inside of the inferior extremities. Pulse 120 or more. The tongue was red and dry, and the child quite stupid. Throat not much affected. I prescribed a teaspoonful of a saturated solution of sulphite of soda every two hours. The next day Dr. Hatch, of this city, saw the case with me, and diagnosed it scarlatina, complicated with erysipelas. The sulphite of soda alone was

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continued. In 48 hours her pulse came down to 100. She began to eat as usual, and the constitutional symptoms of the disease completely subsided, although the rash remained out the usual time, and the erysipelatous inflammation continued for nearly a week. She took the sulphite of soda in 12-grain doses every two hours for seven days, with no other medicines, when she was perfectly relieved, desquamation following as usual.

Mr. Morse, aged 24 years, Assistant Quartermaster in the army, was taken sick with typhoid fever in Missouri, and removed whilst sick to his residence in Dubuque, where he was very sick for three or four weeks. Before fully recovering, he came to Chicago to visit his friends. I saw him after he had been here a few days, April 24, 1863. He then had fever, and severe pain in the upper and inner part of the tibia. I prescribed tinct. veratri viridis with morphine, to relieve the severe pain, with cold applications over the inflamed part. He grew worse very fast, and being satisfied that it was periostitis, I laid it open to the bone. No amount of pus escaped, though the operation relieved him very much. In eight or ten days he seemed to be nearly well, when he was suddenly taken with a chill, which lasted two or three hours, and erysipelas appeared in the same limb below the knee, with a red streak along the course of the vessel, above the knee to the groin. The parts were inflamed in the track of the vessels, and very tender on pressure, knotty and uneven. In short, he had phlebitis, with erysipelas. I prescribed sulphite of lime, ʒj every four hours, with morphine to relieve pain and vomiting. He retained nothing on the stomach but morphine for the first twelve hours. He then retained the sulphite of lime, and we continued it in drachm doses every three hours for three days, with fomentations of hops on the limb, when the pain and swelling over the large vessels were relieved, though the erysipelatous inflammation below the knee continued in patches. The fourth day I prescribed tinct. ferri chloridi, 20 drops every six hours, with the sulphite of lime, ʒj every six hours alternately, which he took for four days, remaining about the same. At that time Dr. N. S. Davis saw the case in consultation with me. It was agreed that we should continue the same medicines, but give them every four, instead of six hours, and that an opening should be made near the external malleolus to prevent sloughing, for the parts had the appearance of gangrene. I made a deep cut in the part, but, as we anticipated, found no pus, though it relieved the pain and pressure, and probably prevented more or less sloughing. This course was followed for two or

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three days, until he could not retain the iron and sulphites on the stomach; they were then discontinued, and sulphate of quinia was given in three grain doses every four hours for four days, when he was taken with chills and vomiting, pulse 120, mind wandering, and phlebitis occurred again in the femoral vein. I prescribed sulphite of lime 3j with quinia in doses of gr. ij alternately every four hours, with porter and all the nourishment he could take. In 48 hours the severe constitutional symptoms were relieved as well as the local symptoms of phlebitis; these remedies were continued three days longer, when the sulphite of soda was substituted for the sulphite of lime, as being less constipating to the bowels. Under the use of these remedies, with a generous diet, for a few days, he so far recovered that it was unnecessary to visit him.

Mrs. B., aged 35, when between two and three months in utero-gestation, was taken suddenly with uterine hemorrhage, May 19th, 1863, and abortion occurred on the 20th. She lost a large amount of blood at the time, but was quite comfortable for the first 24 hours. On the 21st she had a severe chill, which lasted two or three hours. I saw her soon after the chill; her pulse was 120, small and wiry; skin moist and hot; severe pain and tenderness in the uterine region; tongue dry with great thirst. Diagnosed the case, metritis of a malignant character.

I prescribed sulphite of lime, 3j every three hours, with hot fomentations over the bowels.

22*d*. Passed no urine during the night, and has severe pain from distension of the bladder. Pulse 110; tongue still dry; soreness of the bowels about the same. Evacuated the bladder with the catheter, and whilst introducing it examined the uterus and found it very tender. Continued the sulphite of lime with no other remedy.

23*d*. Pulse 90; tongue more moist; bowels not as tender, and much better in all respects, with the exception of the irritation of the neck of the bladder. For this I prescribed fluid extract of buchu and uva ursi with the sulphite of lime, both of which were continued for four days, when she so far recovered that further medication was unnecessary.

The foregoing is the substance of the article which I read at the last meeting of the Association.

Since that time I have prescribed the sulphites of soda and lime with good success in almost every well-marked blood-poison case

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that I have been called upon to treat, without regard to the location or form of the disease; whether hospital gangrene, phlebitis, malignant erysipelas, scarlatina maligna, diphtheria, variola, uterine phlebitis, or malignant typhoid fever; not, however, to the exclusion of other remedies indicated in the particular case, but for the purpose of relieving the system of the constitutional effects of the poison, by preventing its morbid ferment or action on the vital fluid until sufficient time had elapsed for the poison to be eliminated from the system.

I will first give a few cases only, where I have used the sulphites as the principal remedy, and then relate such cases as I have been able to obtain from others who have prescribed these remedies, which I trust will give better satisfaction than to relate more cases of my own.

CASE I. Miss K., aged 20, was taken suddenly with a chill, May 7th, 1863. I saw her a few hours after, when she had fever, pain in the head and back; pulse 120; tongue coated; skin hot and dry. Supposing it to be a case of fever of the remittent type, I prescribed ipecac. and morphine, gr. ½ each, every four hours as long as the fever continued, with gr. x of mass. hydrargyri at once.

8th. Heat of the skin subsided; countenance sunken; pulse 130; tongue dry and red; pain in the head with delirium and restlessness. Erysipelas begins to appear on the nose and face, with purple spots in various parts of the body and extremities. Prescribed sulphite of soda ʒj every four hours.

9th. Appears more rational; pulse 120; tongue about the same; bowels moved slightly; erysipelas has spread over the face, ears, and forehead. Continued the sulphite of soda.

10th. Pain in the head better; mind clear; pulse 90; tongue moist; red spots have nearly disappeared; has some appetite, and says she feels well. The erysipelatous inflammation begins to subside about the nose and face, though it still continues on the ears and forehead. Prescribed citrate of magnesia to move the bowels, and continued the sulphite of soda every six hours for three days, when she was entirely relieved without other remedies, though the tinct. ferri chloridi was given after that time for a few days as a tonic.

CASE II. Mr. Rademan, a healthy, robust man, aged 30, of temperate habits, was taken suddenly with sickness of the stomach,

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pain in the head and back, June 19, 1863. I saw him next day, June 20th. He then complained of pain in the head, back, and bowels, with chills; the throat and tonsils were swollen, with ash colored specks in the fauces, bowels constipated, with nausea. Pulse 110; skin moist with no unnatural heat.

I prescribed hydrargyri chlo. mite and pulv. ipecac. comp., āā ℈j; ft. chart. No. ii, one immediately and the other in six hours, to be followed by a decoction of senna, if the powders do not operate in the morning, and applied a flannel cloth wet in a solution of salt in vinegar to the throat.

21*st.* Calomel operated three or four times freely; pulse 112; throat badly swollen; the patient is very restless and stupid; could not look into the fauces on account of the swelling of the tongue. I prescribed sulphite of soda, ℥j every two hours.

22*d.* Rested very little last night; pulse 100 and rather more full; erysipelas begins to show itself about the nose and face, throat not quite so much swollen, can swallow better, and is not so stupid. Continue the sulphite of soda, with pulv. ipecac. comp., gr. x, if restless.

23*d.* Pulse 96, tongue moist, throat improving, erysipelas spreading over the face and forehead; is not so stupid, and perfectly rational, though he had fever last night and did not rest much. Continue the treatment.

24*th.* Had a high fever with delirium last night, and did not sleep any. This morning pulse 85, tongue moist, throat better, erysipelas about the face subsiding. Prescribed sulphate of quinia gr. iv every three hours, in the absence of the fever, and continue the sulphite of soda.

25*th.* Fever came on before he commenced taking the quinine, was delirious and slept but little last night, but feels much better this morning. Pulse 80, full and regular; tongue moist, and throat much better. Continue sulphite of soda and quinine each every four hours, with all the beef-tea he can take.

26*th.* Had no fever last night; is much better. Erysipelas and throat nearly well. ℞. Sulphite of lime, ℥j every six hours, with sulphate of quinine, gr. iij every six hours alternately.

He continued to improve under the use of these remedies, and in a few days fully recovered.

This was undoubtedly a case of diphtheria, complicated with erysipelas, and followed by intermittent fever.

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CASE III. I was called about midnight, April 21, 1864, to see a little girl of Mr. Randall's, about three years old. Found her in convulsions. By the use of a warm bath and vomiting her with ipecac. the convulsions subsided, though she lay in a stupid condition for six or eight hours.

22*d*. Throat swollen, tongue red and dry; pulse 160 or more, respiration frequent, countenance sunken, and a rash of a livid color appeared on the neck and breast. Prescribed a teaspoonful of a saturated solution of the sulphite of soda, to be given every two hours, with a flannel cloth wet in a solution of salt and vinegar and applied to the throat.

23*d*. A rash of a scarlet color is out all over the body and extremities. Pulse 120, tongue more moist, and appears much better. Prescribed a cathartic of calomel to move the bowels, and continued the sulphite of soda.

24*th*. Pulse 90, tongue moist and not as red. Some appetite, throat better, and the rash begins to disappear. She recovered perfectly in a few days, by continuing the sulphite of soda every three hours, with no other medication.

CASE IV. I was called to see John Rudy, aged 18, December 3, 1863, who had been sick two or three days with chills and fever, pain in the head and back, with sickness of the stomach. At that time his pulse was 100, tongue red and slightly coated, complained of pain in the head, back, and through to the stomach, with nausea. Skin hot and dry, and very restless. He had taken some cathartic pills, which had operated. Prescribed morphine and ipecac., gr. $\frac{1}{4}$ each, every four hours until he became easier.

4*th*. Pain in the head and back not as severe, complains of pain in the stomach with nausea, and is partially deranged; face red and swollen, and covered with an eruption which begins to show itself on the body and extremities. Diagnosed the case smallpox, or varioloid. From the severity of the symptoms and appearance of the eruption, I had fears that it would be variola, but as he had been vaccinated when a child, I had hopes that it would put on the modified form of the disease. Prescribed sulphite of soda ʒj every four hours.

5*th*. Feels quite comfortable; pulse 90; tongue moist; eruption more distinct and elevated in every part of the body and extremities; continued the sulphite of soda.

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6th. Patient feels much better; pulse 80; tongue moist and not as red, and has some appetite. The eruption has progressed but little for the last twenty-four hours. Continue the treatment.

7th. Feels well; appetite good, and wants to get up. The redness of the skin has faded very much since yesterday, though the raised papilla can still be felt without any pustules. The sulphite of soda was continued for two or three days longer, when every symptom of the disease disappeared with the exception of a slight redness of the skin.

This being the first case of variola that I ever treated with the sulphites, I was much pleased with the result, and had hopes that we had found a remedy that would arrest the disease and prevent pustulation, but subsequent experience proves that although a valuable remedy in that disease, it will not always prevent pustulation.

CASE V. I was called to see a child of Mrs. Lathrop, two and a half months old, April 18th, 1864, whose father died of smallpox April 12th, after an illness of two weeks. Vaccine virus had been inserted in the babe's arm at three different times after exposure without effect. She had been quite sick for three or four days previously, with occasional vomiting. I found her lying in a stupid condition, pulse very rapid with signs of convulsions. Her face was badly swollen, and the eruption was beginning to make its appearance. Prescribed a small teaspoonful of a saturated solution of sulphite of soda every two hours.

19th. Pulse not as frequent; has less stupor, and nurses occasionally; eruption out on the face, body, and extremities, very thick, though not confluent; the bowels constipated. Prescribed a dose of castor oil and continued the sulphite of soda.

20th. Oil operated twice, and she appears quite comfortable. The case is progressing favorably, though her mother says that she is restless at nights. Ordered the sulphite of soda to be continued every three hours, with twenty or thirty drops of tinct. opii camphor., if she does not rest at night. This course was followed during the progress of the disease, with no other remedy. She nursed as usual during the time, and had one or two evacuations from the bowels daily. The case went on favorably without an untoward symptom. The seventh day after the appearance of the eruption the pustules on the face began to dry up, and on the ninth began to fall, and by the twelfth were nearly all off, and she soon recovered perfectly.

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This was a severe attack of variola for so young an infant, but its course appears to have been shortened, and the symptoms ameliorated by the sulphite of soda, making it more like a case of varioloid than smallpox.

I could relate numerous cases where I have prescribed these remedies with success with other agents. Though I must confess that I have not seen as many well-developed blood-poison cases this season as I ought to expect, considering the number of cases of malignant diseases which have occurred and the epidemic influence which has prevailed in the city during the past year.

It has been my practice ever since I first commenced using the sulphites, to prescribe them in almost every case of a malignant tendency as soon as I discovered any constitutional symptoms of blood-poison, using other remedies, however, at the same time, such as the particular case seemed to indicate. May not the early administration of these remedies account for my having so few bad cases of zymotic disease? I am inclined to think so, although it is a difficult point to establish. For if we arrest a disease before it is fully developed, we cannot say, with certainty, that it would have progressed had the remedy been withheld.

It may be well to state, more particularly, in connection with the subject, that during the past year there has been an uncommon epidemic influence pervading the city, causing malignant erysipelas, phlebitis, puerperal metritis, and other diseases of a malignant character. Smallpox has also prevailed extensively during the time, and the mortality in the city from these diseases has been unusually great. Although the opportunity in the city for giving these remedies a trial has been favorable, very few have improved it; probably from the fact that they have not been in use a sufficient length of time to become established as reliable agents.

After reading the report of my first three cases before the Chicago Medical Society, March 27th, 1863, I requested the members present to try the sulphites in zymotic disease. Some of them complied with my request, and have furnished me with a few cases, which I will relate. I also requested Professor N. S. Davis, particularly, as he had charge of the Mercy Hospital, and was engaged extensively in practice, to give these remedies a trial. He did so, and has since prescribed them in very many cases, some of which are reported in the *Chicago Medical Examiner*, and through his kindness, in complying with my request, I am enabled to give his

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valuable experience and views in regard to the use of these remedies in the following communication:—

"A. FISHER, M. D.—

"*Dear Sir:* In answer to your inquiries, in relation to the use of the sulphites of soda and lime in medical practice, I will simply state the following facts: During the last fifteen months I have used these remedies frequently in such cases of disease as were suspected to depend on the action of an animal poison. During that time I have used them in eight cases of unmodified confluent smallpox; eleven cases of the most severe grade of idiopathic erysipelas; three of cerebro-spinal meningitis; and four of puerperal metritis.

"Of the cases of smallpox, one was an adult female in the third month of pregnancy. I was called on the second day of the eruption. She had never been vaccinated, and the severity of the premonitory fever, together with the copiousness of the eruption, left no doubt of its confluent form and dangerous character. I directed the sulphite of lime in doses of one drachm every four hours, and a single dose of pulv. ipecac. comp. at bedtime, each night. Milk, oatmeal porridge, and beef-tea for nourishment. The eruption progressed regularly, and soon became completely confluent over all the face, neck, and extremities. On the seventh day, uterine hemorrhage occurred moderately, and was soon followed by an abortion, but no symptoms of phlebitis or peritoneal inflammation followed, and the patient convalesced in the usual time, having no part of the time exhibited symptoms of that severe constitutional depression or typhoid condition which so frequently attends the progress of this form of smallpox. No medical treatment, except that already mentioned, was resorted to, and no diffusible stimulants were required during the whole progress of the disease, and her convalescence was rapid and perfect.

"The second case was a boy four years old, who came under my care on the third day of the eruption, and was subjected to the same treatment, except the exhibition of smaller doses proportioned to the age of the child. The disease ran its course without any dangerous symptoms, the convalescence was rapid, and unattended with any unpleasant sequelæ.

"The third case was an adult male, aged about 27 years. I was called to see the patient one day preceding the eruption. The febrile symptoms were very severe, and not being certain that the disease was variola, I gave him four doses of calomel with

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ipecac., and followed by a laxative. The following day the eruption began to make its appearance, and soon studded the surface so thickly as to show its confluent character. He was at once put on the use of drachm doses of sulphite of lime, with about eight grains of pulv. ipecac. comp. each night and morning. He passed through the disease safely, although at the time the suppurative stage was completed, he suffered an attack of pain in the chest with cough and expectoration, tinged with blood, for which he took a powder of pulverized opium, one and a half grains, with one-sixth of a grain of tartarized antimony, every four hours for two days, after which the antimony was omitted and two grains of quinine were substituted. The pneumonic symptoms soon disappeared, and convalescence was completed.

"The fourth case was a female, aged about 30 years, to whom I was called on the second day of the eruption. I first prescribed an infusion of the sarracenia purpurea, but after trying two days I found she was not willing to drink enough of it to give the remedy a fair trial, and the disease assuming a very severe form, I directed a solution of sulphite of soda and tincture of belladonna in doses of fifteen grains of the first and ten drops of the last every two hours. During the last half of the suppurative stage her pulse became feeble, and I gave the sulphite of soda at longer intervals, and gave between each of the doses twenty drops of the tincture of chloride of iron. She also took six grains of pulv. ipecac. comp. and three grains of pulverized gum camphor every night. She recovered well, although her convalescence was more tedious than in the three preceding cases.

"The fifth case occurred in a young man of full habit and sanguine temperament. The premonitory fever, and also that accompanying the suppurative stage of the eruption, were very severe, and in the last-named period characterized by almost constant delirium. He was treated almost exclusively with the sulphite of soda and belladonna, given in the same manner as in the fourth case, and a dose of pulv. ipecac. comp. to procure rest at night.

"Two of the remaining cases were adult males, and were treated from the commencement of the eruption to the end with sulphite of soda, fifteen grains every three or four hours, and pulv. ipecac. comp. to procure rest at night; and in the latter part of the suppurative stage, twenty drop doses of tinct. ferri chloridi. All these cases recovered well. The remaining case occurred in a boy about 12 years old, in a poor family occupying badly ventilated rooms.

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The boy had not fully recovered from the convalescent stage of typhoid fever when he was attacked with variola. He was treated in the same manner as the last three cases mentioned, and the disease ran its course without alarming symptoms, until the suppurative stage was completed, and most of the scabs were detached from the face and upper part of the trunk. He began to feel well and sat up in bed, and amused himself with some playthings.

"Regarding the patient as past the crisis of his disease, the sulphite of soda had been omitted and the tincture of iron given in its place. At this stage he was seized with a chill, followed by all the symptoms of pneumonic inflammation, from which he died in about four days.

"You are aware that during the last year the smallpox has prevailed to an unusual extent in our city. The foregoing eight cases constitute only about one-sixth part of the whole number that have come under my care during the year.

"But three-fourths of the remaining cases were of the mildest grade of *varioloid*, and the other fourth simple, distinct, or discrete smallpox.

"Consequently, they needed and received but little medical treatment of any kind. The diet in all the cases was such as mentioned in the first case detailed above. One of the cases, however, terminated fatally by the supervention of pneumonia during the stage of desquamation. It was a child eighteen months old.

"Ten of the eleven cases of erysipelas, in which the sulphites were used, were treated in the Mercy Hospital. They belonged to the most severe grade of cases that have occurred during the recent epidemic of that disease. They were all characterized by strongly-marked typhoid symptoms; and in four, the intestinal discharges were so frequent as to constitute diarrhœa. They were treated with the sulphite of lime in drachm doses, given every two hours, until the progress of the disease was arrested, when the interval between the doses was lengthened to four hours, and the remedy continued until convalescence was fully established.

"In those cases complicated with diarrhœa and more or less tympanites, oil of turpentine and tincture of opium in the form of an emulsion, were given between the doses of sulphite of lime, until those symptoms were removed. All the cases recovered.

"Several of them have been published more in detail in the *Chicago Medical Examiner*. The last case alluded to occurred recently in private practice. It was a man past the middle period

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of life, who received a contused wound on the vertex of the head. It was followed by severe erysipelas, which extended rapidly over the whole head and face, accompanied by some delirium. I treated him with the tincture of the chloride of iron for four days without any amelioration of symptoms. He was then given sulphite of soda, 15 grains every two hours, and in two days the progress of the disease was arrested. The remedy was given at longer intervals until convalescence was fully established. In all the cases of erysipelas the diet was milk and animal broths.

"Of the three cases of cerebro-spinal meningitis, two were treated with the sulphite of lime and belladonna, with cold applications to the head and neck; and the third was treated with the sulphite of soda and belladonna, with warm narcotic fomentations to the neck and occiput. These cases recovered. They are detailed more fully in the *Chicago Medical Examiner*, for July, 1863.

"Two of the four puerperal cases resulted from abortions, and consisted in severe phlebitic inflammation. Both cases were received into the Mercy Hospital, and were examined and treated in the presence of the clinical class. The symptoms were such as to leave no doubt of uterine inflammation, probably of a phlebitic character. Believing this to originate from the action of poisonous animal matter in the uterine cavity, from decomposition of clots, &c., I gave them internally the sulphite of lime in doses of one drachm every three hours, with pulverized opium one and a half grains between. In twenty-four hours the pain was greatly relieved and the frequency of the pulse diminished. The sulphite of lime was continued, but the opium was diminished one-half. Under this treatment, both patients progressed favorably until their recovery was complete. The two remaining cases of puerperal disease occurred after delivery at the full period. They were ushered in by a chill, one on the second, and the other on the third day after confinement. They came under my care during the first twenty-four hours. The pulse, in both cases, was over 120 in a minute, and small; the respiration accelerated; countenance anxious; much restlessness; pain in the lower part of the abdomen, pelvis, and back; tenderness in the hypogastric region with some tympanites; the local discharges scanty and offensive. The medical treatment of these cases consisted in the administration of one drachm of the sulphite of lime every two hours, and a powder of opium and calomel each 1½ grains between. At the end of twenty-four hours, the interval between the doses of medicine was lengthened one hour,

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and the calomel omitted. With this modification the treatment was continued during the subsequent three days, with a steady improvement of the patients, until convalescence was established. In these puerperal cases, of course, due attention was paid to cleanliness, diet, &c. And it may be said that the curative influence exerted by the treatment was due to the opium. This is undoubtedly true, so far as the exertion of a direct control over the existing inflammation is concerned, but in most cases of phlebitic inflammation, whether affecting the uterus, or other parts, the danger to the life of the patient is not so much from the simple extent or progress of the inflammation, as from a pyæmic or septic change in the blood, and through it on the vital properties of the tissues generally. It has long been known that the extent of the local lesions apparent after death in puerperal fever, erysipelas, variola, &c., do not generally correspond with the severity of the symptoms, or the rapidly fatal tendency of the more malignant form of these diseases. Indeed, it may almost be claimed as a rule, that the more speedily fatal any given case becomes, the less will be the visible traces of local inflammation after death. In variola, for instance, the most fatal cases are those in which the poison multiplied in the blood during the period of incubation, fails to excite the ordinary pustular inflammation in the skin, but continues to circulate in the blood, depressing the vital properties, and inducing that condition which has long been recognized as malignant. The next most fatal cases are those in which the virus generated is so copious in quantity, and the consequent pustular inflammation so severe as to constitute the confluent form; during the suppurative stage of which more or less of the purulent matter, so extensively bathing the cutaneous tissue, becomes reabsorbed, inducing a secondary poisoning of the blood, with the supervention of typhous symptoms and frequently death. It was more particularly to prevent this secondary poisoning of the blood that the sulphites were given in the cases of variola referred to in this communication. And how far their favorable progress and exemption from all typhoid or pyæmic symptoms, during the stage of suppuration and desquamation, were owing to the use of these remedies, it is impossible to determine with certainty. I have sought diligently for opportunities to test, by experiment, whether the free exhibition of sulphites during the period of incubation in variola would either prevent or lessen the development of the virus in the blood, and thereby either prevent or modify the development of the disease. The universal practice

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of vaccination, however, renders such opportunities rare. During the unusual prevalence of variola during the past winter, the following facts transpired. The wife of one of the patients laboring under confluent smallpox, mentioned in this letter, had an infant in her arms only four weeks old. I vaccinated it immediately, but at the same time directed the mother to give it a small dose of the sulphite of lime three times a day. At the end of four days, finding the vaccination had failed to produce any effect, I vaccinated it again, but still continued to give the sulphite of lime as before. This second vaccination also failed, and although the infant remained in the same room with its father through the whole progress of his sickness, yet it never gave any signs of having either variola or vaccinia, except a peevishness and very slight fever for two or three days. I simply give you the facts for record, well knowing that any single case of the kind is not sufficient to justify any deductions. It is hardly necessary to add that in administering the sulphites in the foregoing cases of erysipelas, phlebitis, &c., it was solely for the purpose of preventing that septic or deteriorated condition of the blood, which gives to these diseases their chief danger. That the results of these cases are not sufficient to fully establish the value of these agents, I freely admit.

"They are such, however, as to justify a much more extensive and careful use of them in all those forms of disease arising from the action of animal poisons on the blood, such as the eruptive fevers, erysipelas, pyæmia, hospital gangrene, &c. My present convictions are, that whenever these remedies can be so used that they are actually present in the blood at the time that absorption of the animal poisons takes place, they will greatly lessen, if they do not entirely prevent, the deleterious actions of such poisons, on the constituents of that fluid. Pardon the length of this letter, and believe me,

Yours truly,
N. S. DAVIS."

The following case is from A. B. NEWKIRK, M. D.

"Dr. FISHER—

"*Dear Sir:* I herewith comply with your request to furnish you with a synopsis of the case of catalytic disease in the person of Mr. Down, a report of which was read before the Chicago Medical Society in January last; in which the sulphite of soda was used with very satisfactory results.

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"Mr. Down was taken ill October 19th, 1863. I was called to see him on the third day of his sickness, and found him laboring under congestion of the chylopoietic viscera, with obstinate constipation of the bowels and vesical retention of urine. The latter feature of the case continued during his illness; a mild febrile action supervened upon the yielding of the two former features of the case, which continued with more or less regularity for six days.

"The more prominent features that were presented in the case after the eighth day, were, paraplegia, cystitis, urine of a strong alkaline odor, and loaded with muco-purulent matter, mixed with venous or decomposed blood; discolored spots the size of a five cent piece, of a dingy red color, appearing first upon the ankles and lower leg, then upon the wrist and forearm, and extending to the entire surface; the outside of the feet were much inflamed and blistered, presenting the appearance of a burn, from which was discharged an ichor attenuated with a thick muco-purulent matter. There was also some swelling and tenderness along the course of the femoral vessels.

"On the eleventh day of his illness, you were called in consultation, and I here copy my notes of that day, November 2d. We find the general aspect of the case such as to leave no doubt of this being a well-marked case of blood-poison disease, fully developed and of the utmost malignancy. The face is pallid, with anxious and cadaverous expression; breathing quick and irregular, with frequent sighing; pulse 120, intermitting, weak, and fluttering; voice weak and husky; breath very fetid; face, hands, and feet quite cold; paraplegia complete; has been sick at the stomach, with frequent vomiting of a dark grumous fluid for the last twenty-four hours; has had two involuntary and offensive discharges from the bowels during the night; urine drawn off has a very strong alkaline odor, and of the appearance of decomposed blood and mucus mixed; has taken no nourishment for the last twenty-four hours; discoloration of surface more livid in appearance. For the last twenty-four hours the patient has been under the use of the tinct. ferri chloridi, during which time he grew rapidly worse.

"Mr. D. was now put upon the use of a saturated solution of sulphite of soda, a tablespoonful every hour. To our agreeable surprise, the nausea and frequent vomiting were relieved in a few hours after commencing the use of the sulphite, and every other urgent symptom not produced by the local disease; the cystitis was relieved in a few days. On the second day of the use of the sul-

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phite, tonics and remedies to act on the diseased bladder were added. After the sulphite of soda had been used four days it was discontinued for a few days, but the patient did not appear to do as well, and its use was resumed and continued for ten days.

"The general condition of Mr. D. improved very satisfactorily up to the 29th of November. The paraplegia and discoloration of the surface were removed, his appetite became good and his strength so improved that he was able to sit up a little, although the condition of the bladder continued much the same.

"Mr. D. was taken very sick, November 29th, with severe pain in the bowels and vomiting or belching of a greenish fluid, and died December 1st.

"*Post-mortem.*—We find the bladder completely disorganized, very much thickened in its parietes, and extensively ulcerated, one of the ulcerated openings in the posterior wall large enough to admit the thumb, through which the urine and muco-purulent matter passed into the peritoneal cavity, producing inflammation and extensive adhesions between the bladder and contiguous tissues. There was more than a quart of fluid of the same character as that drawn off with the catheter, in the lower part of the peritoneal cavity, with perhaps as much serum.

"The liver, kidneys, and other abdominal viscera were healthy. There were a few patches indicating slight inflammatory action upon the serous membrane, covering the small intestines and mesentery, but no adhesions.

"Although Mr. D. died, it is evident, from the history of the case, that, had it not been for the ulceration and perforation of the bladder, he would have recovered, and that the morbid condition of the system was removed by the sulphite of soda. For he grew worse rapidly until we commenced giving it, and then soon began to improve, so that in a few days the morbid symptoms of blood-poison disappeared without other remedies."

The following case is from HIRAM WANZER, M. D., of Chicago.

"Dr. FISHER:

"You desire me to give a synopsis of all the cases where I have used the sulphites of soda and lime.

"I have used the sulphite of lime in a number of desperate cases, believing with success, but the tinct. ferri chloridi and other remedies were used at the same time, so that I cannot say that the sulphite of lime was the curative agent. But I will give you the notes of

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one case which I read before the Chicago Medical Society last summer, which I think is in point.

"I was called to see a case of hydrocele in a man 60 years old, the 28th of April, 1863. I tapped the scrotum twice and drew off large quantities of serum, but again the fluid reaccumulated, and Dr. Fisher saw the case with me in consultation. We had fears that the testicle was enlarged, and he proposed to lay the sac open freely and let out the fluid, and if the testicle was diseased remove it. He accordingly operated in presence of Drs. Heydock, Marguerat and myself, by making an incision into the sac nearly the length of the tumor; about a pint of serum escaped. At the upper part of the scrotum was a cul-de-sac, in which was found a considerable quantity of fluid of a sanious character, which not being evacuated by the first tapping, accounted for the appearance of enlarged testicle. We found the testicle in a sound and healthy condition, and did not remove it. The parts were brought together and left to suppurate. The operation appeared to be a success, but in a few days untoward symptoms set in. The wound secreted sanies and most horribly offensive pus. There were evident symptoms of phlebitis or pyæmia approaching, with great prostration of the vital powers; there was general anæmia and pallor of the skin. The countenance was hippocratic and cadaverous.

"I used freely the chlorides as disinfecting washes, internally gave him freely tinct. ferri chloridi, alternated with anodynes. The patient was not relieved by any of these measures. I again consulted Dr. Fisher. He advised drachm doses of the sulphite of lime every four hours. There was a marked change in the patient after he had taken eight doses. I gave him another ounce in the same way, when further medication was unnecessary.

"There was a mysterious something that rapidly and decidedly changed the diathesis of the patient in less than 48 hours, not so specially the condition of the wound, or the character of the discharge, as in the marked amelioration of all his general symptoms.

"If it was the sulphite of lime that wrought this early and decided change in the unhappy condition of the patient, will some one of the Society explain the modus operandi of its mysterious action?

"The patient recovered perfectly from the disease, and supported his family by day labor for some time after."

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Notes of a case treated by Drs. BARTLETT and BLAKE, and reported by JOHN BARTLETT, M. D.

"Dr. FISHER—

"*Dear Sir:* In compliance with your request I furnish you with the following extracts in the case of Mr. ———, with the view of showing the effects of the sulphite of lime in a case of pyæmia.

"The patient had received, about four months previously, a very serious compound comminuted fracture of the leg. Much sloughing had occurred, and there was a large cloaca at the seat of the injury, which had not been thoroughly cleansed of secretion.

"Twelve hours before the visit which furnishes the basis of this note, the patient was attacked with violent pain in the chest. His pulse was 128, his respiration 32. There was profuse sweating; the tongue brown, dry, and glazed; the face pale, and the expression anxious. A portion of the right lung was engorged. The left lung in the pericardial region was in the first stage of pneumonia. A loud to-and-fro sound indicated inflammation of the pericardium.

"In short we had no doubt but that our patient was laboring under pyæmia.

"Mustard was applied over the heart, and one ounce of the sulphite of lime given, in the succeeding sixteen hours. In forty-eight hours every symptom was found to have disappeared.

"Ten days previously, Dr. Blake assures me, the patient had a similar attack. The treatment and the result were the same.

"It is important to state that, in anticipation of blood-poisoning, the patient had been kept under the use of the sulphite of lime almost continuously from the beginning, and that both of these attacks occurred when the medicine had been discontinued for some days."

These three last-mentioned cases were undoubtedly all well marked cases of catalytic or blood-poison disease of the most malignant character, and are well calculated to show the effect of these remedies in bad cases; for the septic condition of the system was restored to its normal state by these agents alone, if by any remedies, for they were the only ones used, until the morbid symptoms were entirely removed. Also the septic condition returning when the sulphites were omitted for a few days, shows the necessity of a continuation of the remedies, after the patient is apparently restored, to prevent relapses.

It will be remembered that Dr. Polli, in his experiments on

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dogs, first saturated them with the sulphurous acid, by giving them large quantities of the sulphites of the alkalies or alkaline earths before injecting pus and putrid substances into their veins to induce septic diseases. Consequently, before I commenced using these agents, my highest aim was to prevent the blood from becoming further deteriorated by the poison; hoping by their use to hold the action of the poison in check, as it were, long enough for its elimination from the system, not expecting to relieve the patient of the effects already produced. Though, after watching the operation of these remedies in numerous cases, I believe I am warranted in saying that, in some cases, they not only prevent the morbid change of the blood and tissues, but restore them to their normal condition, and, in cases where there is no local inflammation established, the patient is relieved by their use from the morbid influence of the poison and restored to health.

In epidemic erysipelas of a malignant character, especially where it is complicated with phlebitis or pyæmia, these remedies are invaluable, by preventing the morbid influence of the poison until the erysipelatous inflammation subsides or is relieved by appropriate remedies. But in local erysipelas of a mild character, the effect is not perceptible, and, indeed, I am not sure that they have any special effect, for such cases usually recover under ordinary treatment.

I have prescribed the sulphites in quite a number of cases of variola, two of which I have related; in one, as already stated, it appeared to arrest the disease and prevent pustulation, but as that effect did not follow its administration in other cases, it might not have proceeded to pustulation had the remedy been omitted.

However, in every instance where I have prescribed these remedies, in bad cases of this disease, the morbid condition of the system was relieved, and the pustules matured and dried up earlier than usual, rendering the case mild and manageable. Others who have prescribed these remedies in this disease have noticed the same effect.

In diphtheria I have prescribed these remedies in two cases. They were bad ones, and both recovered. Further experience will test their value in this disease.

In uterine metritis or uterine phlebitis, these remedies are undoubtedly valuable. Professor N. S. Davis relates four cases successfully treated with them, and I have used them in two cases, one of which I have just related, where no other remedies were used that could possibly have effected the cure.

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I will not further particularize the diseases in which these remedies have been used to advantage, but say at once that they will be found useful in all septic or blood-poison diseases without regard to the stage of the disease, though the earlier we commence with them, the better will be our hope of success. They are without doubt valuable also as prophylactics, and where we can anticipate a malignant case of blood-poison they should be given.

From Dr. Polli's experiments, and from my observations with regard to the use of these remedies, I have arrived at the following conclusions:—

1st. That the sulphites of soda and lime can be given to patients suffering from zymotic diseases, in large quantities, and continued for a long time, without producing deleterious effects on the system.

2d. That (in accordance with Dr. Polli's experiments) the sulphurous acid is disengaged from the alkaline base in the system, permeating it in every part, thereby preventing fermentation or decomposition of the blood.

3d. That they do not destroy or decompose the poison in the system, but prevent its deleterious action on the blood, and consequently the tissues, until it is eliminated from the system.

4th. That the quantity prescribed should be in proportion to the malignancy of the disease, that is, the more hopeless and malignant the case, the greater should be the quantity administered in a certain time.

5th. That these remedies should not be too suddenly withheld in bad cases, but continued until the poison is carried out of the system by the emunctories.

6th. That the effect of these remedies, in well-marked cases of blood-poison for the first few hours, is imperceptible; but by continuing them a day or two, the secretions become improved, and the patient is relieved of the morbid symptoms.

7th. That these remedies will not cure inflammation of an organ already established, though in cases where they are indicated, they prevent the deleterious effect of the poison until the inflammation subsides or is relieved by appropriate remedies.

8th. That the use of these agents will not prevent the use of other remedies indicated in the particular case, unless chemically incompatible.

9th. That these remedies are generally well retained on the stomach, though the dose is large and the sulphurous taste is disagreeable to some patients.

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10th. That the more malignant and hopeless the case, the more perceptible and satisfactory will be the effects of these agents, unless the case is beyond the reach of remedies.

The question has often been asked, which of these two remedies is the most reliable? In my opinion there is very little difference, unless there is diarrhœa or looseness of the bowels; under such circumstances, the sulphite of lime is altogether preferable; but in the opposite state of the system we generally use the sulphite of soda.

It has been difficult to obtain a pure article of sulphite of lime in Chicago for the past year, consequently I have used most frequently the sulphite of soda.

The preparation of sulphite of lime, which I first prescribed, was prepared by Dr. Squibb, of New York, specially for internal use. It was an impalpable powder, insoluble, with a very slight sulphurous taste, and in appearance like magnesia. But the article generally kept in the shops is very different; it is coarse, has a strong sulphurous taste, and is unfit for internal use, and for fear of impurities I do not prescribe it.

The dose or quantity of these remedies necessary to be given to relieve the system from the morbid effects of the poison, is not yet fully determined. Calculating from the experiments of Dr. Polli, I first commenced with a drachm of either of these remedies every four hours, and being so well satisfied with the results, I have continued to prescribe them in the same dose, though repeating it every hour or two in urgent cases, until the morbid symptoms began to yield, then every three or four hours according to the necessity of the case. Professor Davis and others, I find, have adopted a similar course. But what quantity will eventually be found most beneficial, further experience will demonstrate.

In conclusion, I have only to say that I have endeavored to investigate the effects of these remedies with care, and have reported the facts with impartiality and truthfulness. Not expecting, however, that we have fully established these agents as specifics in zymotic diseases, but hoping that the cases related in connection with the interesting communication from Professor Davis will induce the profession to test these remedies in catalytic diseases more fully, and demonstrate their true value.

Should this report have that effect, my object in bringing the subject before the Association will be accomplished.

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THE

CAUSATION, COURSE, AND TREATMENT OF INSANITY IN WOMEN: A GYNÆCIST'S IDEA THEREOF;

BEING THE

REPORT

OF THE

STANDING COMMITTEE ON INSANITY FOR 1864-5.

BY

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VOL. XVI.—9

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THE CAUSATION, COURSE, AND TREATMENT OF INSANITY IN WOMEN.

I. Selection of Special Topic for Report . . . . . Page 123
II. Point previously attained concerning Insanity in Women . . " 130
III. Work still to be done . . . . . " 135
IV. The Brain the Seat of Insanity, but not of its Cause . . " 140
V. Explanations of Distant or Reflex Causation of Insanity . . " 157
VI. Causation of Insanity often Pelvic in Women . . . . " 167
VII. Rationale of a Pelvic Causation of Insanity . . . . " 200
VIII. Indications for the Treatment of Insanity in Women . . " 220

I.—SELECTION OF SPECIAL TOPIC.

It was decided at the meeting of the Association, held at St. Louis in 1854, to establish a standing committee, annually to be chosen and regularly to report "upon the subject of insanity as it prevails in this country, including its causation, as hereditary transmission, educational influences, physical and moral, social and political institutions, &c.; its forms and complications; curability; means of prevention, &c."

It is now eleven years since the Committee was first appointed, and, as yet, there seems to have been rendered no report! Special committees, it is true, upon particular points, selected by the Association, and connected with the general subject of insanity, have twice attended to the duties assigned to them. I refer to the excellent papers upon the Medical Jurisprudence of Insanity, by Dr. Coventry, of Utica, N. Y.; and upon Moral Insanity in its Relations to Medical Jurisprudence, by the late Dr. D. Meredith Reese, of New York City, both of them rendered to the meeting held at Washington, in 1858, and contained in the published volume of *Transactions* for that year. A similar report upon the Morbid and Therapeutical Effects of Mental and Moral Influences is expected the present year from Prof. Palmer, of Michigan. As regards, however, the regular Standing Committee upon insanity, the fact

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remains as I have stated; it has uniformly failed to accomplish its work.[1]

This is the more surprising when we consider to what extent the subject has been studied in this country, the excellence to which our general system of hospital arrangement has been brought, and the eminence attained by many American Superintendents.

These gentlemen have been freely placed upon the committee appointed by the Association in years past, if, indeed, it has not in each previous instance been selected from them alone, and it is a matter of extreme regret that, as yet, they should not have responded to this call; for there are few subjects attended with the interest to the profession at large that pertains to this of insanity, few with such important bearings upon the welfare of the community and its relations to medical men, few with such fruitful fields for labor and success.

It will undoubtedly be alleged that in the fact that the hospital superintendents of the several States have united themselves into a separate organization, the so-called Association of Superintendents, meeting annually for purposes of conference, and publishing a journal devoted to the interests of their specialty, there was enough accomplished for all the purposes of science and practical art, leaving it unnecessary for any annual contribution to either to be made through the channels of this Association; we, however, of the profession at large can hardly acknowledge the justice of such reasoning. Special journals, however ably conducted and with whatever extent of circulation, do not reach the great body of general practitioners. As well ought it be said that any contribution to the science of ophthalmology, which of all the departments of medicine now seems to boast the largest and most enthusiastic number of skilled devotees, would be out of place or undervalued with ourselves, simply because that branch has now its own national organization and its special journals.

[1] Dr. Hills, of Ohio, Superintendent of the Central Lunatic Asylum at Columbus, who was charged with the duty of reporting last year at the New York meeting, as chairman of the Committee on Insanity for 1864, was prevented from fulfilling that trust; among other causes, by "the breadth of foundation he had laid for an elaborate report." At his request he was granted an extension of time until the present year, when, it is to be hoped, the Association may reap the fruit of his labor and long experience. It will be perceived, however, that this arrangement did not interfere with the appointment of a new committee for 1865, which it was understood by the Nominating Committee is annually required by the organic law of the Association.

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Every specialist, no matter what his favorite study, whether insanity, ophthalmology, or the diseases of women, owes his first duty to the profession at large, for it is through it that his observations or his discoveries must really become effective. It is through those that apply upon the widest scale, theories to practice, and practice to its ultimate demonstrations, that the largest results are to be gained; and in this matter of insanity, for every patient that is carried to an asylum for treatment, scores are treated in their earlier stages, wherein the chances of success are allowed to be infinitely the greater, by the profession outside asylum walls; and for every patient that is ultimately cured in an asylum, in hundreds the derangement threatening is warded off by judicious general or special treatment at home, in changed localities, or at so-called water-cures, whereat, though so often associated with the vilest forms of quackery, there is much more frequently success than is generally acknowledged.

Now be it distinctly understood that no man can put a higher value than I do upon our public hospitals for the insane; there are few of the profession, not directly connected with these institutions as physician or trustee, who have studied them more carefully or upon a larger scale, both in their minute details and their comparative plans and methods of management, than myself. I believe them to be excellently conducted, their medical officers to be men well selected, of skill, and worthy the highest trust.

The records of the Association of these gentlemen show the most painstaking and extended efforts at improvement, and reflect, as does the Journal conducted in its behalf, the utmost credit upon itself collectively, and its individual members.

Had the Society of Superintendents but put itself into more direct connection with this Association, of which its members are, almost every one of them, in present fellowship, it would have effected more towards establishing the high standard, and accomplishing the good it has intended.

The opinion has prevailed in many quarters, it has, to a certain extent, been inculcated, as in the most excellent work upon the medical jurisprudence of insanity, by my friend Dr. Ray, that no one could possibly know much of insanity, or at any rate be accepted as of any authority upon the subject, unless he were a member, as superintendent or ex-superintendent, of this inner circle.

But a man cannot study a special point in medicine, with interest, assiduity, and good faith, for several years, without forming decided

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conclusions thereon. If, moreover, his position, by accident or other advantage, has been such as to render him perfectly independent of all party or individual bias, *nullius addictus jurare in verba magistri*, these conclusions should have the greater weight, and if in addition he approaches the subject from a standpoint comparatively new, certainly so as far as previous employment of it to attain a practical end has been concerned, and if he is able to show that measures, which in one quarter, namely, in civil practice, are found very effective for cure, in another quarter, namely, in asylum practice, are as yet generally and practically unrecognized, his conclusions should be very apt to carry with them conviction.

Such, I would respectfully submit, is my own position with regard to the present report. It is offered as a plain straight-forward statement of facts, commending themselves to the good sense of every member of the profession.

Upon the general subject of insanity, volumes upon volumes have already been written, some of them of interest and very practical use—much of them of none. I have no desire to add to the host of abstruse and abstract discussions of metaphysical points in psychology, already far too numerous. Were I an asylum superintendent, I might delight the Association by a discourse upon the excellent systems by which hospitals are now heated and ventilated, or the question as to whether, as regards economy, it is better for superintendents to raise or to purchase their own supplies; upon the psychological characteristics of Milton, Shakspeare, Dante, and the several dramatis personæ, supernal, mortal, or demoniac, of these and other masters; upon the comparative merit of restraints or non-restraint, and as to where the latter is supposed to begin and to end; whether Aubanel or Brigham invented the crib, and its merits or demerits as compared with the bedstrap of Wyman, and this again with the fingerless gloves of Parkmann, the handless sleeves and muff of Haslam, the belts of Reil, and of the York Retreat, the manacles of Ruer, and the chains of time immemorial, the bifurcated sack of Horn, the knee breeches of Neumann, and the buckled straps of Nostitz, the leathern mask of Autenrieth, the pear-shaped frame for the mouth, and the gag, the wicker basket of Guislain, the suspended box of Hayner, the cord and the restraining chair, the dark chamber and the padded room, the rotary machine of Darwin, the suspended seat of Cox, the hanging mat of Hallaran, the hollow wheel of Hayner, the swing of Chiarruggi, the douche and the surprise bath, the proposal of our own Rush,

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whose treatise had many years a more extensive circulation among American physicians than all other works upon mental disorders together, that because refractory horses are subdued by being kept from lying down or sleeping, and because elephants when first captured are tamed by depriving them of food until they discover signs of great emaciation, that therefore the insane should be kept in a standing posture and awake for four and twenty hours, and fasting for several days! A comparison of these and many similar methods, and whether a little etherization is not after all much the best; upon whether in insanity the mind is or is not diseased, or only partially hidden by a transient cloud; upon the pathological results of insanity, and why it is that in every affection of the mind no matter how diverse or opposite, we may find identical conditions of the brain, or no trace of disease whatever, and in every lesion whatever of the brain we may find an entirely unaffected mind; and the host of other theoretical, practical, and transcendental questions, so fully and so ably discussed in the pages of the *American Journal of Insanity*, of the *Asylum Journal of Mental Science*, of the *Journal of Psychological Medicine*, and the other able periodicals devoted to the interests of the insane. As it is, having been chosen by the Association to this work for the reason, as I suppose, that I have long been delving in the special field of hysteria and the reflex, nervous, and neuralgic demonstrating of invalid women, I take it for granted that what is expected at my hands is, to a certain extent, of a special character; although of necessity, as all specialism rests upon general principles, I shall endeavor not to lose sight of the general basis upon which it lies.

The *causation* and the *cure* of insanity are its alpha and omega. The last of these has usually been sought the first, and it is because the other, upon which it wholly depends, is so often unsearched for wisely, if at all, that both are so seldom attained.

In deciding, therefore, to devote the major part of this report to an attempt at an elucidation of the true causation of mental disturbance in a large proportion of the cases in which it obtains in women, and of a more rational treatment than is generally adopted, I took early occasion to consult my colleagues upon the Committee, who are all of them superintendents, and, without a single exception, of public and State hospitals for the insane. They are Drs. BANCROFT of New Hampshire, VAN DEUSEN of Michigan, PATTERSON of Iowa, WOODBURN of Indiana, and WORTHINGTON of the Friends' Asylum at Frankford, Pennsylvania.

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With reference to the opinions of the gentlemen, as expressed in letters from which I shall quote, it may be stated that I had previously avowed it as my belief that very many cases of mental disturbance in women are of reflex character, arising from pelvic irritation, and that local treatment would prove of advantage in very many more cases than those for which as yet it has ever been employed.

Dr. BANCROFT writes me as follows:—

"I freely admit that a large proportion of cases of insanity (even in both sexes) are of reflex origin, and not the result primarily of cerebral change.

"I am well aware, also, that many attacks of insanity in females originate in uterine disturbance of some sort, and are cured by treatment directed to that organ.

"A part of those cases, I have no doubt, require topical treatment, and of course demand examination by tact and the speculum. *No one would be more thankful than myself for better facilities than are at present afforded for investigating and teaching these cases.*[1]

"What would be the best method of accomplishing this object, I have not yet a settled opinion.

"I have read your published articles in the *Boston Medical and Surgical Journal*, and, if I correctly understand you, you hold that the principal cause of insanity in females is uterine disorder of some kind, and that the principal treatment in females is therefore to be directed to the uterus; and I infer further from your writings that topical treatment stands, or should stand, most prominent.

"Although admitting to a more limited extent, the truth of your positions, yet I am not prepared to give that form of disease so prominent a place, as to give to it the whole report to the exclusion of other topics.

"Although your idea is one of importance, and should receive a due share of attention, I think to allow it to absorb the whole report would but partially and imperfectly discuss the great points of interest pertaining to insanity in this country."

From Dr. WORTHINGTON, I have received a communication of similar import.

"I believe it is the general opinion among asylum physicians,"

[1] The italics above are my own, and are used because of the importance of the admission here made in reference to incidental points hereafter to be considered.

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he says, "that insanity in a great majority of cases is unattended with any organic cerebral change, and the large number of cases of the disease attributable to ill-health, in the reports of hospitals for the insane, is evidence of the belief of their authors, that the disease is very commonly consecutive to disorders of the general system. Among these disorders, I have no doubt that those of the genital apparatus in both sexes are productive of a considerable number of cases of insanity. I can call to mind a case where a simple displacement of the uterus was the cause of an attack of insanity of two years' duration, which was remedied in this institution in a short time by confining the patient to bed, and applying a suitable pessary. In all cases under my care, where there is reason to believe that uterine disease may be the cause of the mental disorder, I have always been in the habit of making special examinations, and I have sometimes called in the assistance of medical friends, who have made these diseases an especial study.

"On the other hand, I have gradually become convinced that we may attach too much importance to these disorders as a cause of insanity, and that in our willingness to refer the mental symptoms to irritation reflected from the uterus, we may overlook the more serious idiopathic cerebral disease. I have known the latter occur coincident with uterine disorder, and yet entirely independent of it; and have myself lost valuable time in treating the uterine affection, and afterwards, on addressing my remedies to the true seat of the mental disorder, have had the satisfaction of seeing my patient speedily recover. Such cases may not be very numerous, but they are very important to bear in mind, and I would beg leave to call thy attention specially to them. It appears to me to be particularly desirable to discover in the character of the mental disorder itself, without reference to other symptoms, some marks by which we may be able to decide whether a case is one of idiopathic or sympathetic cerebral disorder."

Dr. VAN DEUSEN confines himself to a discussion of a single point only, and that merely an incidental one, as compared with the broad subject upon which I addressed him, and concerning which we have seen Drs. Bancroft and Worthington so fully express their opinion. The matter to which his communication is limited is that upon which I read a paper at the last meeting of the Association, which will be found published in the volume of its *Transactions* for 1864, the necessity, namely, for the more thorough elucidation of each case of insanity in females, that con-

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sulting physicians should be appointed to every hospital for the insane. To Dr. Van Deusen's letter I shall hereafter refer.

Dr. WOODBURN writes me as follows:—

"I read your article, published some time since in the *Boston Medical and Surgical Journal*, and was well pleased with the contents, but would venture to suggest that probably insanity is not so frequently caused by female diseases as the paper would seem to indicate. My opinion is that mental derangement is always caused, either by physical disease or bodily injury (accidental cases), or by malformation (hereditary cases). The malformation may be apparent, or may possibly be only of the elementary cells.

"I had intended to write a short paper which you might incorporate with your report if you thought proper, but in the press of other duties I have been compelled to abandon it."

From Dr. PATTERSON I have received an interesting communication upon the general causes affecting the mental health, more particularly of women in country districts, which will be found in another portion of this report.

Willing as I should have been to have incorporated the opinions of my colleagues to a greater extent in this report, whether or no they were confirmatory of my own, it will be seen that I am compelled in great measure to assume its sole responsibility.

II.—POINT PREVIOUSLY ATTAINED.

Reference has been made in the letters of these gentlemen to views concerning the causation of insanity in women that I have already expressed. These will be found in full, or in abstract, in the published proceedings of the American Academy of Arts and Sciences for 1864–5, and in various numbers of the *Boston Medical and Surgical Journal* for the same period. It may be that the experience of others, if carefully analyzed, will not wholly confirm me in the position that I have assumed; the lapse of many months, however, since I first threw out a hint of my convictions, in the report of the Massachusetts State Commission on Insanity for 1863–4, has but served to render me the more decided in my every assumption, and I believe it will be found just as it was with my statements concerning the frequency of criminal abortion—a report upon which as chairman of the special committee upon

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this subject, I had the honor to render to this Association in 1859[1]—that though my premises were so startling, and of so practical results, as to be by many denied, more careful and more general investigation has shown that they were in reality very much understated.

Preliminarily, I wish it distinctly understood:—

1st. That I assert for the insanity of women, neither an universality of causation or of treatment. As I have already been misinterpreted upon both these points in my previous writings, clearly as I have endeavored to express myself, the disclaimer now made is not unnecessary.

2d. I have shown that in the writings of alienists, there is comparatively very little to be found in acknowledgment of the part played by her *sex*, in the causation and prolongation of insanity in women. As regards suggestion, approbation or demand of a consequent and rational treatment, even less than this can be produced from the authors referred to.

I do not state, however, that the key to insanity in women has not long been in possession of these gentlemen, but I prove by the facts adduced, that though they may have possessed it they have not appreciated that the theory referred to would unlock what has always been in every asylum, as in every psychological text-book, a sealed question and an opprobrium. They have not used it for this purpose in their annual reports, in their memoirs, in their published statistics, or in their medical treatment.

3d. I have alleged that in a very large proportion of the cases of insanity occurring in women, her sex is in reality the predisposing, the exciting or the continuing cause of the malady; but, I do not assert that there are never present other predisposing, exciting, or continuing causes at work efficiently in women as in men.

4th. I have claimed that from the above premises, it follows that the treatment of insane women should in many instances be of a direct and physical character; but this, it will be allowed, is a very

[1] To my colleagues upon that committee, Drs. Blatchford, of New York, Hodge, of Pennsylvania, Pope, of Missouri, Barton, of South Carolina, Lopez, of Alabama, Semmes, of the District of Columbia, and Brisbane, of Wisconsin, all of them gentlemen much older and of higher standing in the profession than myself, I shall always feel under deep obligations for the brave and sympathetic alacrity with which they indorsed views that at that time seemed to many of an earlier school, heretical or unfounded.

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different thing from teaching that the treatment of insane women should always and only be local, which I have never advised and which I should myself be the first to condemn.

5th. As a means, and only as a means, toward the end at which we all are aiming, namely, the cure of the patient, I have endeavored to exhibit the necessity at every asylum of a board of consulting physicians, skilled in the diagnosis and treatment of uterine disease; which is now acknowledged to especially require erudite tact and an appreciative mind; but I have distinctly stated that such aid was only to be made use of at the discretion of the superintendent, whose monarchical and exclusive sway, legislative and executive, economical and financial, spiritual and corporeal, could thus in no wise be lessened or interfered with.

If superintendents are not in reality afraid of a shadow, if they are not disinclined to allow the profession at large to participate in the study of mind diseased, why this tone of suspicion, or jealousy, or fear, that a simple, needed and practical suggestion by a medical man who knows whereof he is speaking, has in certain quarters called forth?

I have ventured to call the attention of the profession to the results then and now again to be placed before them, as in every respect important, and in some respects novel. Their right to this last attribute has been challenged, and in a quarter where, in view of all the circumstances, we should have last looked for any counter claim. I refer to a statement by the Editor-in chief of the official organ of American Superintendents, Dr. Gray, of the Utica Asylum.[1] Abundant evidence will be afforded in the present paper to settle all doubt upon this score.

I merely wish thus beforehand to define my position; asserting as new only the attempt to apply upon the large scale to the treatment of insane women, in asylums as in private practice, views that in theory were partially recognized even by Hippocrates, though they have been practically acted upon by few or none of his successors.

My position is rather that of the pioneer than of the discoverer. There is little positively new in medicine—there is much that is comparatively so. Not a statement, however original, to which a previous clue has not existed and cannot be found. Not a psychologist, however practically he may disbelieve in a local origin for mental derangement, and may have put his disbelief on perma-

[1] MS. Letter of Dec. 1864.

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nent record, but might aver that such origin were perfectly familiar to him, that he learned it in his mother's womb, or imbibed it from her bosom, even that he inherited its knowledge from his ancestors, for cases enough were on record in their day and from time immemorial.

I have referred to a disposition on the part of certain individuals, apparently very few in number, to misinterpret or to undervalue facts that may be stated, or deductions that may be drawn, by any one who is not professedly a psychological specialist, and upon that ground. I shall therefore take the liberty of fortifying some of the points that I shall make, by the evidence or the language of gentlemen whose position within the inner circle alluded to is such as to render their authority unquestioned.

For instance—and as it is a question that met me upon the very threshold of this report, I have little hesitation in presenting it. What shall be allowed to render a man conversant with the various phases of mental disturbance? One superintendent, the physician to the Utica Asylum, considers that it can only be attained by prolonged residence in an insane hospital. Under date of Jan. 11th ult. he writes me as follows, and in expressing an opinion as to views of my own, unless this was arrived at very superficially or at second hand, he must have been aware that they were based upon no isolated case or two, but upon a dozen years of almost exclusive observation, upon the most extended scale, of sick women.

"It certainly appears to me," he says, "that some practical experience in the management and treatment of the insane, acquired not from an isolated case or two, but in some large hospital, would greatly modify your ideas.

"You would then have an opportunity of ascertaining what is really known on the subject, and what treatment is actually practised in these institutions."

On the other hand, it is possible that careful comparisons of the actual working detail of many hospitals, of the plans, medical and in other respects, under which they are conducted, and of the ideas of their respective superintendents as afforded by their various systems of treatment, seen in operation, and described personally by the gentlemen themselves, may perhaps give even a better knowledge of what is really known on the subject, and what treatment is actually practised in these institutions, than a residence, no matter for what length of time, at any asylum in the land. In

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no matter is the old saying of Morgagni more true than in this: "Perpendendæ, non numerandæ, sunt observationes."

Is a knowledge of [psychological] literature sufficient to make one a safe guide? There is, I will venture to say, no department of medicine, save the closely allied and more properly considered pseudo-science of phrenology, whose literature is so crowded with contradictory statements and conflicting theories, with utterly baseless generalizations and facts misinterpreted, as this department of insanity. Each successive text-book has repeated the errors, or many of them, of its predecessors. There are, it is true, notable exceptions, the various works of Ray for instance—which are all of them, for originality of thought, for closeness of observation, and for justness of reasoning, veritable oases in this most barren of deserts—but even Bucknill and Tuke, whose book is in many respects one of the best of modern medicine, still retain the old, and that ought to be obsolete, artificial classification; which, last relic of an ancient nósology, would separate all the forms of insanity in accordance with their several symptoms, and by ignoring the great and fundamental question of their causation, would reduce to a matter of unsafe and blind routine their chance of cure. Each author moreover, and often without a word of credit, repeats the details, insufficient or irrelevant though they may be, of cases that seem to have been handed down from time almost immemorial, judging from the distance backward to which in several instances I have traced them. It was my first intention to have presented in this report a summary of all the cases on record, so far as I could collect them, illustrative of the diagnosis, positive and differential, that had been formed, and of the treatment to which insane women had been subjected, by past and present masters in this art; and for this purpose I had tabulated or made minutes of a mass of cases amounting probably to several hundreds; but, upon more carefully examining them, they were found so faultily or so imperfectly reported, as for all practical purposes to be utterly useless.

What, for instance, shall I say of the fact that while in scores and in hundreds of cases great care has been taken to say whether the woman had or had not had the itch, for psora was formerly considered an important agent in the causation of insanity, in scarcely any, on the other hand, however plainly connected with pelvic derangement, is any physical examination mentioned or its results given—a method of studying and reporting that does not

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seem to have ceased with the years bygone? Or what of the similar fact that, in the autopsies of the insane, it has seldom seemed necessary to critically examine other organs of the body than the brain, even though that showed no trace whatever of lesion? Or what, again, of the other fact, still almost universal, that in the cases of undoubted pelvic origin or influence, at least in those that have been reported, where attempts at physical exploration have been made, precise mention is omitted of the exact species of local disease that was ascertained to be present, so important in deciding as to whether the means resorted to for its relief were exactly what were required—without which correspondence, it is evident a cure could not be hoped, and a failure to effect it could prove no error as to the ultimate causation of the mental disturbance? A mind that has been trained in the arena of modern general practice, and is accustomed to depend only upon the most rigid and rigorous methods of diagnosis, finds little in such faulty material that either satisfies or is edifying.

Let me give upon this point a single forcible word from one of the best authorities in this country, Dr. Workman, of Toronto, the superintendent of the immense government asylum of Canada West. He writes me as follows:—

"So much has been written on insanity, as I am sure you know, the tendency of which has only been to becloud the subject, that even when one is fortunate enough to command a good proportion of the works, he has to wade through terrible cesspool accumulations, or scramble over piles of forsaken habitations, before he dare venture to say to the world that he has begun to study."

With this word of explanation, which will have been seen to be necessary, I proceed.

III.—WORK TO BE DONE.

I had intended to have presented in this report a carefully prepared and somewhat complete essay upon the insanity of women; it being my opinion, as stated in my paper published in the last volume of the *Transactions* of the Association—

I. That in women mental disease is often, perhaps generally, dependent upon functional or organic disturbance of the reproductive system.

II. That in women the access or exacerbation of mental disease

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is usually coincident with the catamenial establishment, periodical access, temporary suppression, or final cessation. And, therefore,

III. That the rational and successful treatment of mental disease in women must be based upon the preceding theories, which I have claimed are established:

1. By many analogies, physiological and pathological, in the cerebral manifestations of the human female and that of the lower mammals;

2. By clinical observation; and

3. By the results of autopsies of the insane, both in private practice, and, where made with equal care and partiality, in insane asylums.

To cover, however, properly all the ground that I had marked out would occupy a larger space than, perhaps, one has a right to claim for a single report; and since it was commenced I have received communications, published and private, of such a character as have satisfied me that it is better at this time and in this place to strike boldly at the very root of the present system of theory and management of insanity in women, before attempting to train a healthier and sturdier growth in its stead. Being convinced of being upon the right track, I intend, health permitting, to pursue it, and, to prove that I am in earnest, now subjoin a sketch of the essay that I had already partially prepared for submitting to the Association at the present meeting.

I. Causation.

The insanity of women proved generally peripheral and reflex:

1. By evidence negative.
   - *a.* Admissions of psychologists.
     - α. Cerebral disease without insanity.
     - β. Insanity without cerebral disease.
   - *b.* Omission of autopsies.
   - *c.* Neglect at autopsies.
   - *d.* Results of autopsies.
     - α. At asylums.
     - β. At general hospitals.
     - γ. In civil practice.
2. By evidence positive.
   - *a.* Analogies from
     - α. Other sympathetic results.
       - I. On nerves sensory.
       - II. On nerves motor.
       - III. On functions, organic.
       - IV. On functions, animal.
       - V. On fœtus in utero.

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β. Madness in lower mammals.
γ. Admissions.
I. Of psychologists.
II. Of gynæcologists.
III. Of women themselves.
δ. Cases on record.
I. Psychical.
II. Obstetrical.
ε. Cases now first given.
ζ. Autopsies.
I. On record.
II. Now first given.
η. Time of development.
I. Fœtal.
II. Congenital.
III. Puberal.
IV. Catamenial.
V. Nuptal.
VI. Gestal.
VII. Puerperal.
VIII. Lacteal.
IX. Climaxal.
X. Senile.
XI. Organic Disease.
θ. Effect of treatment.
I. At asylums.
II. In civil practice.
ι. Reflex induction of cerebral derangement.
κ. Reflex cure of cerebral derangement.
λ. Not necessary to expect uterine disease always to produce insanity, even if it were allowed that insanity in women were usually induced by uterine disease.

II. Theory of Ultimate Causation.
1. Effect on general health.
a. Of pain.
f. Of abnormal flux.
α. Hemorrhagic.
β. Leucorrhœal.
γ. Lacteal.
2. Cerebral irritation.
a. Direct.
b. Reflex.
3. Circulation of carbon—uneliminated.
a. By lungs.
b. By uterus.
α. In virginity.
β. In pregnancy.
I. Healthy.
II. Diseased.

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4. Dystocia.
5. Uterine inheritance.
    α. Metritic.
    β. Placental.
6. Toxæmia.

III. Indications of Prevention.

IV. Indications of Rational Treatment.
1. To ascertain the primary lesion.
2. To prevent exacerbating influences.
3. To relieve physical symptoms.
4. To remove the exciting cause. It being of no slight moment,
    a. At what stage a patient is treated.
    b. And in what way she is treated, whether
        α. According to the individual case, or
        β. By routine.

It will be perceived that there is much that can be said, that I believe has not been said, upon this most interesting and practical topic, just as there is much that can be done, that has not yet been done, towards relieving or curing its unfortunate victims. I have now at hand a large mass of material, original and collected, concerning the various points above indicated, that I shall hope to present to the profession at some future period.

In the mean time, I shall endeavor to take by the horns one or two little chimeras that have been shaken at me, or at any rate to look them in the face.

It has been asserted, in communications addressed to me since I have been appointed upon this Committee, or in publications intended to break down, to discredit, or to ridicule my testimony—

1. That insanity in women is seldom dependent upon a pelvic cause.

2. That it has so frequently been recognized as thus dependent, that any discussion of the subject is unnecessary.

3. That thorough physical examinations of insane women are already generally made whenever required.

4. That such are not required.

5. That they would be positively injurious to the patient herself, and, if in an asylum, to the other patients, and to general discipline.

It will be hardly possible for me to give to each of these contradictory points the attention their importance deserves, although I am prepared in each instance to show their utter worthlessness.

In what, however, I shall say, I shall endeavor, so far as possible, to take my arguments from psychologists themselves, using in the

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main their own words, originally written though these may have been for a different purpose, and in ignorance of the real character and meaning of the facts described. Were gentlemen aware of the inconsistencies, both in theory and practice, that are everywhere recorded in their special literature, they would be much more careful than one or two of them have lately been, for it is evident—

1. That if my views are true, but yet long known, the local examination and treatment ought not to have been stated to be generally unnecessary or positively injurious; and

2. That if they are false, then it cannot be claimed that they have long been recognized as well founded, and in practice daily carried out to the letter—both of which conflicting assertions have been made by gentlemen claiming to be leaders in the specialty of insanity.

Due allowances are of course to be made for a certain measure of professional conservatism, however arrogantly expressed, and I do not entirely indorse, though I quote, the following remarks by Dr. Galt, of Virginia, himself a superintendent and then of the Eastern Asylum. They are none the less pertinent, however, as coming from that source, and as made to rebuke the tendency of an older school to repress innovation, or even inquiry.

"The laudator temporis acti," says Dr. Galt, "is so common, that we do not think it necessary to quote the opinions of the past on the present subject. As a general rule, writers allow a change to be effected if, as they say, it is feasible. But such a mode of argument is no longer admissible. He, who opposes the proposed arrangement, must be prepared to defend himself on the assertion of its intrinsic inferiority. Admitting, however, such fancies to stand for what they are worth, we still find the medical world divided as to the matter in question; and this circumstance itself should induce us to lean to the new views, because every one is aware of the prejudices which association weaves about established customs and regulations. It is said that when Harvey declared to the world his discovery of the circulation of the blood, no physician beyond forty years of age gave in his adhesion to the new views."[1]

[1] American Journal of Insanity, xi. 229.

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IV.—THE BRAIN THE SEAT OF INSANITY, NOT ALWAYS OF ITS CAUSE.

I have dared to say that, in my opinion, the ancient and still usual classification of insanity which artificially divides the forms of mental aberration according to their mental peculiarities is faulty and erroneous. Such a method of classifying disease, according to its symptoms alone, would not at the present day be tolerated in any other department of medicine. It is the more necessary to dwell for a few moments upon the question here involved, for it lies at the foundation of this report, and upon its decision depends, in great measure, the truth of my views concerning the insanity of women, novel or trite as these may prove.

Dr. Workman, of Toronto, to whom I have already alluded, seems to have argued more boldly and more ably for the extra-cerebral causation of insanity than, perhaps, any other writer in this country, both in his own writings and his late translation of Schroeder van der Kolk's little work upon the *Pathology and Therapeutics of Insanity*, in the *American Superintendents' Journal*.[1]

He writes me as follows: "What can be more exact, what more rational, what more practically suitable than the assignment of all cases of insanity to the two grand heads, idiopathic and sympathetic? in other words, fixing all insanity either *in* the brain or *out* of it. It has long been my belief that unless in confirmed low dementia and idiocy, insanity has no *necessary* connection with *diseased* brain properly so called. I believe that when appreciable palpable disease exists in the brain, we always have something *besides*, and something *essentially* different from insanity. It does not satisfy me to be told that disease in the brain may exist and be undetectable. We do not admit this assertion in application to any other organ or structure. If you ask me to admit the presence of disease in the eye, or the ear, or the lungs, and fail by scalpel or microscope to demonstrate it, am I sceptic because I refuse credence?

"The circular argument of starting with the premises, that as the brain is the organ of the mind, and insanity is a disease of the mind, therefore the brain in insanity must be diseased, whether we detect the disease or not, has, it appears to me, been too long deferred to. The fallacy here may exist in any one, or in all, the terms of the syllogism.

[1] American Journal of Insanity, April and July, 1864, p. 63, &c.

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"1stly. I would say, I do not comprehend the term 'organ of the mind.' I understand the terms organ of sight, organ of taste, organ of digestion, of circulation, of urination, &c. &c., but where is the parallelism, or even the resemblance, between these functions and thought?

"2dly. What is meant by *disease* of mind? What is the parallelism, or even remote resemblance, between any form of bodily disease and mental abnormality?

"3dly. Why should a diseased brain be essential to insanity? If it is absent in a single case, its presence cannot be essential. I believe it is absent in *many* cases, yea, in the majority of cases. Have you carefully noted the mental condition of persons dying under pulmonary consumption? And if so, have you not often been struck with its close approximation to insanity? Pulmonary disease is present in a very large proportion of cases of insanity, and I believe in incurable cases it is present in fully one-half. We may, or we may not, discover cerebral lesion *super*-added, very generally, I think *not*. This fact is surely one of much significance.

"In *all* emotional insanity of women, and especially in the religious forms, I am persuaded the generative organs play a most important part. I would almost say, they give the ground-tone."

I shall now proceed to show—

1. That while the brain is undoubtedly the seat of insanity, yet it is not necessarily the seat of its cause;

2. And that this is proved by *à priori* reasoning, and, both negatively and positively, by the results of autopsies.

3. That while idiopathic insanity, requiring direct cerebral or simply moral treatment alone, is very rare, sympathetic, or reflex insanity, requiring treatment of a special character, is extremely common.

4. And that, on the one hand, such reflex causation is and should be much more common in females than in males, while, on the other hand, of the various forms of it occurring in females, the majority of them are owing to functional or organic diseases of the uterus and its appendages. In other words, that they are of a sexual character.

These facts I shall support at this time only by the evidence of superintendents themselves—by no means exhausting the testimony of this character that I have at hand, nor drawing upon the extensive material that is afforded me from other quarters, which

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I shall reserve for future communications upon the subject that may hereafter be made by me to the profession.

The first witness whom I call is Dr. Ray, of the Butler Hospital at Providence, R. I.

"It can hardly be necessary at the present time," says this gentleman, "to prove the fact of the dependence of the mind on the brain for its external manifestations—that, in short, the brain is the material organ of the intellectual and effective powers. Whatever opinion may be entertained of the nature of the mind, it is generally admitted, at least by all enlightened physiologists, that it must of necessity be put in connection with matter, and that the brain is the part of the body by means of which this connection is effected. Little as we know beyond this single fact, it is enough to warrant the inference that derangement of the structure, or of the vital actions of the brain, must be followed by abnormal manifestations of the mind, and, consequently, that the presence of the effect indicates the existence of the cause. Whether the morbid action arises in the digestive, or some other system, and is reflected thence to the brain by means of the nervous sympathies, or arises primarily in the brain, the soundness of the above principle is equally untouched. This leads us to the source of the hesitation that has been evinced by pathologists to consider the brain as the seat of insanity.

"From the fact that organic lesions are not always discoverable after death in the brains of the subjects of insanity, it has been inferred that the brain is not the seat of this disease; though, if this fact were true—it being also true that no other organ in the body invariably presents marks of organic derangement in insanity—the only legitimate inference would have been, that, in some cases, it is impossible to discover such lesions by any means in our power. The strangest theoretical error which this soundness of the brain in some cases has occasioned, is that of denying the existence of any material affection at all, and attributing the disease entirely to an affection of the immaterial principle. If the same pathological principles had guided men's reasoning respecting this disease, that they have applied to the investigation of others, this error would never have been committed. It will scarcely be contended, at the present day at least, that the structural changes, found after death from any disease, are the primary cause of the disturbances manifested by symptoms during life; or that if the interior could be inspected at the beginning of the disease, any of

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these structural changes would be discovered. It is now a well-recognized principle, that such changes must be preceded by some change in the vital actions of the part where they occur. This vital change is now generally expressed by the term *irritation*, and nothing is implied by it relative to the nature of this change, more than an exaltation of action. Irritation, then, is the initial stage of disease—the first in the chain of events, of which disorganization is the last—and, of course, nothing can be more unphilosophical than to attribute disturbances of function, exclusively, to any structural changes that may take place during the progress of these successive stages."[1]

To what pathological actions, or structural changes, is the brain then liable? And here I present the evidence of Dr. Bucknill, of England, medical superintendent of the Devon County Lunatic Asylum. "As an organ abundantly supplied with bloodvessels," he tells us, "the brain is obviously liable to all abnormal conditions, which irregularities in the quality or quantity of the blood, and the relation thereof to its tissue, can occasion; it is liable to anæmia and to hyperæmia both passive and active, and to the latter accompanied by organizable and unorganizable exudates. It is also more readily acted upon by various chemical changes in the blood than any other organ. Excess of carbon or defect of oxygen tells first upon it; and many substances in the blood which affect other organs little, or not at all, affect this noblest of the organs with intense force. All diseases, therefore, which depend upon the movement or quantity of the blood, and many of those which depend upon its quality, are the fruitful source of abnormal cerebral conditions. There are, it is true, many blood-poisons and diseases which do not affect the brain. Thus, it is strange, that although the gout-poison affects the temper strongly, and often endangers the intellect, that of rheumatism has no effect thereon. Tuberculosis, moreover, while attacking every other organ of the body, very rarely affects the adult cerebrum. But the brain is liable to a species of disturbance, apparently quite unconnected with the quality, quantity, or movement of the blood, a species of disturbance to which other organs are liable only in a modified and unimportant degree. We allude to the disturbance caused by sympathy with injuries of, or noxious influences applied to, peripheral portions of the nervous system."[2]

[1] Medical Jurisprudence of Insanity, pp. 128–130.

[2] Manual of Psychological Medicine, p. 349.

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These sympathetic disturbances, however, occasioned by the irritation of some part of the distal nervous system, do not necessarily produce any anatomical changes, if the examination is made during the early period of the disease.[1] After a while, the brain may pass from the state of physiological excitement into that of pathological change, and alterations in its structure then be found on examination, although this is by no means necessarily the case.

"The condition of the cerebral substance is the prime question in the pathology of mental disease. Frequently this condition can only be judged of by the state of its bloodvessels, or can only be guessed at by that of its membranes, or some still more remote indication. Not unfrequently, in partial and sympathetic insanity, it appears to be perfectly sound in structure, although the deductions of science assure us that this soundness is in appearance only, and is solely attributable to the imperfection of our means of observing and investigating.

"To the pathologist the substance of the brain is as yet practically structureless. Although the microscope reveals cells and tubes, and intervening stroma, up to the present time it is unable to indicate when they are in a normal or abnormal state; and although it may prove that in some cases the smaller arteries are diseased—that in a few others there are exudation-corpuscles, or an increase of fatty particles in the substance itself—it has not yet enabled us to distinguish between the states of the whole organ which must be diametrically opposite—for instance, between the state of hypertrophy and atrophy."[2]

Let us again listen to Dr. Ray.

"It has been stated by Foderè, in explanation of the pathological causes that produce the alternation of paroxysms and lucid intervals so constantly seen in certain forms of insanity, that the former are attended by an excessive plethora of the bloodvessels of the brain, and the latter by a relaxed, atonic condition of these vessels, which is an effect of their previous forcible distension. In this condition they are liable to be suddenly engorged by exciting causes, such as intemperance in eating or drinking, anger, violent exercise, insolation, etc.; or in consequence of a certain predisposition of constitution. It is, indeed, well known that the return of the paroxysms is often retarded by regulated diet, bleeding, quiet,

[1] Manual of Psychological Medicine, p. 403.
[2] Ibid., p. 421.

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seclusion, kind treatment, and the absence of the above-named stimuli. It is thus shown conclusively that in every lucid interval there remains some unsoundness of the material organ of the mind, which may be designated generally as a morbid irritability, which, on the application of the slightest exciting cause, may produce an outbreak of mania in all its original severity."[1]

"But," asks Andral, in his *Clinique Médicale*, "when we have referred the symptoms to hyperæmia in one case, and to anæmia in another, are we come to the bottom of the subject? By no means," he replies to his own question; for this hyperæmia and this anæmia are themselves mere effects, which—a thing very remarkable—the same influence can very often produce.

In Esquirol's great work upon maladies of the mind, published so recently as 1838, his opinions on pathology, which had been in accordance with those still so generally held concerning the insane, will be found to have been considerably modified. Referring to the case of a recent maniac, who was killed by one of her companions, and in whose body he and his pupils were surprised to find no lesions of the brain or its meninges, he declares that pathological anatomy, in spite of the very important labors of Foville, Calmeil, Bayle, Guislain, and others, has not been able to make us acquainted with the organic cause of mania. "Thirty years ago," said he, "I would willingly have written upon the pathological cause of madness. At the present day I would not attempt a labor so difficult, so much of incertitude and contradiction is there in the results of the necroscopy of the insane made up to this time. But I may add that modern researches permit us to hope for ideas more positive, more clear, and more satisfactory."

We are now naturally conducted to the actual results of post-mortem examinations of the insane.

"From this announcement," I again quote Esquirol, "every one might expect that we should be able to point out the seat of insanity, and to make known the nature and seat of the organic lesion, of which insanity is the expression. This we can by no means accomplish. The examinations of the dead have, to the present period, been barren of practical information. The facts observed by Willis, Manget, Bonnet, Morgagni, Gunz, Meckel, Greding, Vicq d'Azyr, Camper, Chaussier, Gall, and others, have produced only negative or contradictory results.

[1] Medical Jurisprudence of Insanity, p. 339.

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"All the labor that has been expended upon the anatomy of the brain has produced no other result than a more exact description of this organ, and the despairing certainty of our being forever unable to assign to its parts the uses from whence we may derive information with reference to the exercise of the thinking faculty, whether in health or disease.

"Before drawing any conclusions," continues this great authority, "from these organic lesions observed among the insane, will it not be well to acquaint ourselves with all the varieties, both of the cranium and of the brain, which are compatible with the integrity of the faculties of the understanding? Would not this be the true point of departure for all our pathological researches? Now, says the learned Chaussier, there is no organ in which we find greater varieties, with respect to volume, weight, density, and in its respective proportions, than in the brain. Have we carefully distinguished the results of concomitant maladies, or those diseases which terminate the life of the insane, from those which belong to mental alienation?

"Organic lesions of the brain reveal themselves by other signs than insanity. Thus, chronic inflammation of the meninges produces compression, which reveals itself by paralysis; cerebral hemorrhage is also manifested by paralysis. Tubercles, cancers, and softening of the brain present peculiar characters, which cannot be confounded with mental alienation. Have we reflected on the sudden and instantaneous cures of insanity? It is in consequence of having neglected these considerations that we reason so erroneously respecting the seat of this malady."[1]

Let us see what light upon these points has been afforded by actual study of the dead.

Autopsies are comparatively seldom made of the insane who die at asylums. The reason, or one reason, of this will have been already made evident—examination of the brain, so barren of result, having usually alone been made. Upon this point I will reproduce evidence that I have already elsewhere presented.[2]

"Many who have professed familiarity with these subjects have asserted that the morbid appearances found in the bodies of the insane were unworthy of record; they should rather have confessed that they were unable to appreciate their value. With the more thorough and complete investigation of these matters, we may hope

[1] Mental Maladies, p. 69.

[2] Boston Med. and Surg. Journal, April, 1864, p. 198.

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eventually to arrive at some correct views as to the nature of those laws, the transgression of which leads to sensorial disturbance, but no approach to the truth can be made except through the portal of morbid anatomy, which has revealed this important fact, that the record of post-mortem examinations, as preserved in an asylum for the insane, differs in most striking and essential particulars from that preserved in a general public hospital."[1]

"Autopsies," said Dr. Douglass to me when visiting the Government Asylum of Lower Canada at Beauport, near Quebec, under his charge, "autopsies of the insane no one thinks of ever making in Canada, save that enthusiast whom you have been visiting at Toronto." While on the other hand, it is from this very enthusiast at Toronto, Dr. Workman, to whom I have already alluded, that the profession is indebted for some of the most important of the steps toward elucidating the real pathology and ultimate causation of insanity in its reflex manifestations, that have ever yet been made.

Dr. Hunt, formerly of the Hartford Asylum, has put the following admission on record: "The number of post-mortem examinations made in the hospitals for the treatment of insanity in this country are very few, and of this number fewer still are ever published. The cause is evident, and is not likely very soon to be obviated."[2]

The examination, which was permitted me, of the very extended, minute, and most suggestive pathological records at Toronto, furnished proof that this paucity of autopsies is owing neither to want of opportunity[3] nor to dearth of practical results, when properly looked for.

It is proved, however, from abundant evidence, that—

1. Insanity may exist without structural changes of the brain, and that

2. Structural changes of the brain may exist without insanity.

"It must be admitted," says Dr. Bucknill, "that we are not yet in a position, as regards our knowledge of the morbid appearances of

[1] Holmes Coote: Journal of Psychological Medicine, vol. iv. p. 384.

[2] I, of course, freely acknowledge that in some instances, as was stated by Drs. Choate and Bemis at the meeting of Superintendents held at Providence (*Am. Jour. of Insanity*, July, 1862), it is difficult or impossible to obtain the consent of a patient's friends to have a post-mortem examination; but this difficulty obtains to an equal degree at general hospitals, where, nevertheless, such examinations are much more common.

[3] Translation of Esquirol, p. 233.

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the brain, to base our nosology upon the revelations of the dead-houses. We can only wait an advance of knowledge which will render this possible."[1]

The late Dr. Bell, of the McLean Asylum, at Somerville, justly considered one of our most reliable authorities, has left no doubtful expression of his own opinion, which was that autopsies of the insane generally present no material lesion of the brain; changes, indeed, there are to be seen, but only those that may have occurred in articulo mortis.[2]

Upon another occasion he stated that, my friend, the late Dr. Burnett, of Boston, one of the most accomplished microscopists in the country, had made examinations of the brain of persons who had died in a state of chronic insanity, but had been unable to discover any change of structure whatever, or any sign to indicate that it did not belong to an individual whose mind was unaffected.[3]

"The brains of the insane," observes Bucknill, "appear to be certainly not more liable than those of others to various incidental affections. Thus in four hundred autopsies of the insane, we have only once met with a hydatid, only once with tubercular deposit in the substance and meninges, only once with a fibro-cellular tumor, and not once with malignant disease. The arteries at the base do not appear to be more frequently or extensively affected with atheromatous change than those of sane persons of the same age; and in the bodies of the insane we have never yet met with that cretaceous deposit in the coats of the small arteries, which makes them feel like pieces of fine wire imbedded in the brain-substance. We have never met with that leather-like and fibro-cartilaginous hardness of resistance to which sclerosis of the brain is described to attain. The two forms of ramollissement are not found more frequently in the brains of persons dying insane than in those of others. The same may be said of the cellular infiltration described by Durand Fardel, with which in four hundred autopsies we have met but twice.

"A large number of brains of the insane we have diligently investigated with a first-rate microscope. The results appear to us to have afforded no distinction between the sane and the insane brain. We have found exudation corpuscles, but only in instances where the existence of inflammatory action was apparent without

[1] Loc. citat., p. 94.

[2] American Journal of Insanity, x. p. 79.

[3] Ibid., xi. 1854, p. 53.

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the use of the microscope; and, therefore, this microscopic test of cerebral inflammation proposed by Dr. Hughes Bennett, appears to be of little value. In inflammatory and softened parts of the brain-substance, we have found fatty degeneration of the coats of the small arteries; but it remains to be seen whether this change is not as frequent in the brains of the sane. We have not been able to discover fatty degeneration of the arteries where the pathological changes more peculiar to insanity alone existed. The same may be said of fatty degeneration of the brain-substance, consisting in the abundant dissemination of amorphous fat particles, which is found in some specimens of cerebral softening.

"It seemed reasonable to expect that, by the aid of the microscope, one would be able to ascertain whether any exudation or addition to the stroma of the brain, or any change in size, shape, or proportionate number of its cells, takes place; and in the indurated brain of chronic insanity, whether that finely fibrillated exudate, which has been described by some writers, actually exists; also, whether, in extreme atrophy of the brain, any proportion exists in the diminution or degeneration in the form of the cells or tubes. In none of these points of inquiry have we been able to attain the slightest success."[1]

It could hardly be expected when the contents of the cranial cavity throw so little light upon the pathological character of insanity, that a study of its exterior could be productive of fruitful results. Such, however, has been assiduously attempted, but the results are neither uniform nor undoubted.

"Although we believe," it is Bucknill who is now speaking, "that the average dimensions of the head are below those of the sane, when the comparison is obtained by the examination of large numbers, still, in a great number of instances, they will be found to be good; and, indeed, the head is frequently not only large, but phrenologically well-shaped.

"We are not aware in what proportion of the sane the shape of the head is peculiar, since it is rare that opportunities occur for making the observation among them; but among the insane a considerable proportion present decided peculiarities in the shape of the cranium. The most frequent one is a want of symmetry in the two sides. One side is rather flatter or smaller than the other; or the whole cranium is pushed over a little to one side;

[1] Loc. citat., p. 430.

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or one side is a little more forward than the other; or the two anomalies coexist, giving the cranium a sort of twisted appearance. These things will not be seen unless they are looked for, with accurate and careful eyes, upon the shaven scalp.

"Sometimes the skull is high and domelike; more frequently it is as if it had been compressed laterally, and elongated from before backwards—heel-shaped, in fact, like the skulls figured by Dr. Minchin,[1] in which the centres of ossification of the parietal bones are increased in number. Sometimes the forehead is preternaturally flat, narrow, or receding, or very large and bulging; or the occipital region is deficient, and the back of the head rises in a straight line with the nape of the neck. Sometimes the skull has a remarkably square configuration. The square and carinated form of skull we have most frequently seen in connection with mania. The dome-like and high vertical skull, and also the unsymmetrical skull, most frequently in melancholia. In mania, the anterior cranium is more frequently of good shape and size than in melancholia. In the latter the forehead is often small and mean, but sometimes it is disproportionately large and globose. The shape of the head, indicated by the rules of phrenologists, can only fairly be expected to coincide with the mental symptoms in those somewhat rare instances in which insanity is the mere development in excess of natural character; and in some such instances we have found the shape of the head tally, in its general outline, with the indications of phrenology.

"Occasionally, depressions are found in the outer skull, which sometimes do, and sometimes do not, correspond with the bulging of the inner table of the cranium. When they do not correspond, we have found that they indicate a local absorption of the diploë.

"It is an interesting question, how far the shape of the skull alters in insanity. If the forehead expands, even in mature age, under the influence of intellectual development, it is likely that it will contract under the influence of intellectual decay. Some writers have asserted that the shrinking of the brain in atrophy is commonly, and to a considerable extent followed, and the cranium filled by a flattening and shrinking of the cranial bones.[2] Rokitansky also affirms that atrophy of the brain frequently gives rise to deposit of bone on the inner table of the skull, especially about the anterior convolutions.

[1] Dublin Medical Journal.

[2] Paget: Lectures on Pathology.

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"We have not satisfied ourselves that the increased thickness of the cranium, which is frequently met with in the insane, is in any way connected with atrophy of the brain. Some of the thickest and heaviest craniums which we have met with have occurred in instances in which there was little or no cerebral atrophy; and the condition of the cranium, where there is undoubted atrophy of the brain, is not unfrequently one of abnormal tenuity."[1]

Thus it is seen not merely that there is no direct correspondence between the exterior of the skull and mental integrity, any more than between the exterior of the skull and the shape and consistence of its contents. We constantly see all the degrees of irregularity and excess or deficiency of cranial development that have been described, in every-day life and coincident with perfect sanity, while even in idiocy it is not necessary that the normal symmetry shall at all be lacking, though this is undoubtedly frequently the case.

It must not be concluded from the examples of microcephalous idiots, that a small head is a necessary accompaniment of idiocy. "On the contrary," says Dr. Tuke, Medical Officer to the York Retreat, "many idiots have large heads, leaving out of the question instances of hydrocephalus." Parchappe has stated, as the result of very careful inquiry, that if there exist a general relation between the volume of the brain and the degree of intelligence, "facts are wanting to deduce rigorously, from this relation, the different degrees of intellectual and moral capacity." Of 100 idiotic heads examined by Belhomme, 84 presented more or less decided malformations of the forehead, occiput, and lateral portions. Twenty-five per cent. had a well-marked want of symmetry. On bringing together a hundred well-proportioned heads, he did not find a single idiot among the number. Gallice, after making a large number of observations, came to the conclusion, that the more intelligent the idiot is, the larger will be his head; but that this results from a greater development of the occiput. And this certainly accords with what Leuret had previously recorded, that the occiput in idiots is remarkably small.

Desmaisons, in his *Memoirs on the Form of the Head in Idiots*, concludes that idiocy sometimes exists without any malformation; that it is impossible to fix upon any malformation peculiar to idiocy,

[1] Loc. citat., p. 410.

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when the volume of the head and its symmetry are retained; and that, in cases of this kind, flattening of the posterior portion of the head is as common as that of the forehead.[1] Gall laid it down as an axiom that idiocy must exist when the head is not more than thirteen inches in circumference; and he says that the measurement of heads in cases of complete imbecility, up to the ordinary exercise of the intellectual faculties, is comprehended between the following limits: The circumference varies from fourteen to seventeen inches, and the arc, between the root of the nose and the occipital foramen, measures nearly twelve. These dimensions, he adds, are accompanied with a greater or less degree of stupidity or fatuity, inability (more or less complete) of fixing the attention on a determinate object, vague sentiments, an irregular train of ideas, speech consisting of broken phrases, &c., and blind and irregular instincts.[2]

Esquirol's statements appear to be somewhat contradictory; for while a table of measurements, which he gives, exhibits a decided decrease in the size of the heads of idiots, he says: "The dimensions of the crania of idiots are equal to those of other men," and concludes by exclaiming "how much work there remains to accomplish, how much research, before we can state the coincidence of the volume and form of the head with the intellectual capacity!"

From the author last quoted I present the following conclusions:—

1. Vices of conformation in the cranium are met with only, or chiefly, among imbeciles, idiots, and cretins.

2. Organic lesions of the encephalon and its envelopes have been observed only among those whose insanity was complicated with paralysis, convulsions, and epilepsy; or rather these lesions appertain to the malady which has caused the death of the patients.

3. The sanguineous or serous effusions, the injections or infiltrations, which we meet with in the cranial cavity, the thickening of the meninges, their adhesions among themselves, with the cranium and the gray substance, the partial or general softening of the brain, the density of this organ, the fibrous, knotty, and cancerous tumors observed within the cranium, all these alterations indicate either the causes or effects of insanity, or rather the effects of a complication to which the patients have yielded.

4. The alterations within the thorax, abdomen, and pelvic cavity

[1] Manual of Psychological Medicine, p. 108.

[2] The Functions of the Brain, ii. p. 214.

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are evidently independent of insanity. These alterations may, nevertheless, indicate the source of mental alienation, by showing the organ primitively affected, which has reacted upon the brain.

5. All the organic lesions observed among the insane are found to exist among those who have never suffered from chronic delirium.

6. Many post-mortem examinations of the insane have revealed no alteration, although the insanity may have persisted for a great number of years.

7. Pathological anatomy shows us every part of the encephalon altered, in a state of suppuration, and destroyed, without chronic lesion of the understanding.

8. From the above data we may conclude that there are cases of insanity, whose immediate cause escapes our means of investigation; that insanity depends upon an unknown modification of the brain; that it has not always its point of departure in the brain, but rather in the foci of sensibility, situated in different regions of the body; as disorders of the circulation do not always depend upon lesions of the heart, but upon those of some other portion of the vascular system.[1]

Lélut, who has also closely investigated this subject, sums up the result of his researches in the following words:—

"1. Numerous alterations of the brain and its envelopes are met with in delirium and insanity, especially in extreme forms of the latter; but these alterations are neither constant nor exclusive.

"2. Hence it must be allowed that the more or less local and coarse alterations in the skull, the brain, and its membranes, cannot be held to be the proximate causes of insanity. They are, doubtless, capable of existing with a delirious or insane condition, but they do not constitute this condition; and frequently they are only the exaggeration, the effect, or the transformation of it.

"3. That which may be given as the nearest approach to the proximate cause of delirium, and to the most acute form of insanity, is inflammatory lesion of the brain and its tunics. But this alteration neither does nor can constitute the state which is anterior to it, and may even destroy life without producing it.

"4. The conditions of the brain which approach the most closely to the proximate cause of the chronic forms of mental alienation, with or without impairment of motion, are without doubt chronic

[1] Mental Maladies, p. 70.

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inflammation of the substance and of the membranes of the brain, its atrophy and induration, which may be accompanied by variations in its specific gravity. But yet these alterations are not the proximate cause of these forms of insanity, because they are neither constant nor exclusive, and they do not make themselves apparent except in an advanced period of the disease."[1]

These generalizations are carried to a still further extent by another writer upon the subject, Leuret, who states—

1. That the authors who believe it possible to establish an anatomical change as the cause of insanity differ greatly among themselves; thus Greding asserted that thickness of the bones of the cranium occurs in 77 out of 100 patients, while Haslam found this condition in 10 only out of 100 patients. Hyperæmia of the brain is recorded by Parchappe in 43 cases out of 100, and by Bertoleni only in 14 out of 100.

2. That some of the cerebral alterations to which insanity is attributed are by no means well established. Thus, in the cases which are cited of hypertrophy of the brain, it ought to have been shown that this was not owing to fulness of its vessels, or to the presence of a serosity in its tissue. These observations have not been made. Again, that which is called dense brain, or a soft brain, expresses nothing distinctly, except in extreme cases.

3. That the value attributed to certain alterations is deduced from a number of observations by far too small, so that one result frequently invalidates another; thus Parchappe has deduced the average normal weight of the healthy brain from thirteen observations upon men, and nine upon women, and on this average he establishes the rule for atrophy of the brain. This average is evidently too small, and indeed Parchappe himself gives different averages elsewhere.

4. That the pathological alterations referred to insanity are met with in patients who have never been insane.

5. That all authors confess that there are insane persons in whose brains no pathological changes are found.

6. That the lesions which are frequently met with among the insane, to which any value can be attached, are only met with in cases in which insanity has been complicated with paralysis; and that, in order to decide if any lesion is the cause of insanity, it is

[1] Essay on the Value of Cerebral Alterations in Acute Delirium and Insanity.

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at least necessary to find it in a case of simple mental aberration, in which there has been no affection of motion or sensibility.[1]

The only answer that has been made, or that can be made, to these arguments, namely, that more minute methods of examination may perhaps be discovered which may show what the most powerful microscope as yet does not, is very unsatisfactory; the more so in view of the fact that the supposition of reflex causation is sufficient to account for every mystery, as it is allowed to do in neuralgia, tetanus, chorea, and hysteria. Dr. Bucknill is here at fault, and, like every other writer who falls back upon the brain as the seat of causation in insanity, proves inconsistent with himself.[2] It is possible that Brown-Séquard and John Dean, of Boston, may yet localize more disturbance in the brain, as they have so much in the spinal cord; but they cannot all.

What conclusion, then, with Esquirol, shall we draw from the facts that have now been presented? That the changes observed in the brain and its membranes are found in subjects who have given no indication of delirium; that organic lesions of the encephalon appertain to paralysis and convulsions rather than to dementia; and that the character and intensity of the delirium are not in proportion to the extent of the organic lesion. What shall we conclude? That the examinations of the bodies of the dead, which have so often furnished important information respecting the seat of disease, present no result which is satisfactory respecting the source and immediate cause of insanity. If in dementia there are indications of compression, sinking and collapse of the encephalon, is this state caused by the engorgement of the vascular system, or by the lessening of the cerebral circulation? Do not the arteries, having lost their elasticity or being ossified, propel with sufficient energy the blood which flows languidly in veins already too greatly dilated? Does not the inflammation of the meninges, by thickening the membranes, or by provoking a too abundant serous exhalation, induce the compression? Does not the contracting of the cranial cavity, by the separation of the internal table, particularly of the cranial portion, contribute to compress the brain? Post-mortem examinations teach us little in this respect; all the organic alterations of the brain or its dependencies appertaining less to the delirium than to its complications.[3]

[1] The Moral Treatment of Insanity.

[2] Loc. cit., pp. 398–400.

[3] Mental Maladies, p. 433.

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Dr. Nichols, of Washington, Superintendent of the Government Hospital for the Insane, has expressed his opinion upon this subject in no uncertain language, "believing it highly important both to science and humanity. Therapeutists and pathologists, we are told, are approaching from different starting-points, a like, rational, and what is much the most important, *true* theory of the proximate cause of insanity, upon which better defined and more rational principles of a more successful treatment of the disease will be based."

Recent English writers upon this subject have taken a middle ground between certain German authors, who believe in a disorder of the mental entity itself, and that much larger class who have vainly expected to connect special forms of mental aberration with pathognomonic changes of cerebral structure, and tell us that "microscopical appearances ought to be regarded more as the *effect* than the *source* of the malady" (Hitchman); that "insanity is a disease of *nervous* origin" (Munro); and that it is "a *neuralgia* of the sensory fibres of the brain" (Dewey). "And I venture to predict," says Dr. Nichols, "that we are on the eve of the *demonstrable* discovery, that all insanity, whether of physical or moral semeiology, is proximately owing to a derangement of the functional activity of the cerebral organ as a generator of what we are accustomed to call nerve power, nervous fluid, &c.

"That function may be exalted or depressed, through the whole or a part of the brain, as we have general mental excitement or general depression, or one or more of the infinite variety of intervening shades and forms of aberration. This purely functional derangement may, and probably not unfrequently does, run into inflammation, but they have no necessary connection, and the more furious mania may, in my opinion, exist without any more inflammatory origin or organic change than obtains in a fit of 'jumping' toothache, which occurs in a moment and goes in the next, without leaving any trace of its existence."[1]

We are thus compelled, at times, to seek the ultimate causation of insanity outside the brain.

"The special student of insanity," says Bucknill, "will do well to study the causes of delirious thought and perverted feeling, in all classes of bodily disorder where they are observable. If he studies insanity alone, he will be apt to fall into the common error

[1] Amer. Journ. of Insanity, xi. 52.

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of attributing its causation to some single pathological state, and his views will be as wrong as they are narrow. But, if he studies perverted feeling as occasioned by gouty or hepatic disease or loss of intellectual power, and fatal coma occasioned by suppression of the urine, and the delirium of fevers, he will be led to appreciate the full extent of blood-change in the production of purely mental affections. In the delirium of cerebritis, he will see a form of insanity undoubtedly produced by inflammation; and in delirium tremens, he will see another form of insanity, as undoubtedly produced by nervous exhaustion. He will thus be enabled to reject exclusive theories of insanity, and be prepared to admit the [truth] of the broad principle, that insanity may be occasioned by any and every pathological state which is capable of taking place within the substance of the brain, however ultimately occasioned."[1]

The various evidences that I have now adduced should tend to convince that, as I have nowhere found expressed so clearly as by Morel, THE BRAIN IS ALWAYS THE SEAT OF INSANITY, BUT IT IS NOT ALWAYS THE SEAT OF ITS CAUSE.[2]

V.—EXPLANATIONS OF DISTANT CAUSATION.

Whence else, then, can insanity arise than in the brain?

It has been supposed by some that it is generally the effect of toxicæmia. This is undoubtedly at times the cause, and probably much more often than has been generally supposed. Besides the instances where its existence is self-evident, there are others. Simpson, of Edinburgh, has of late shown, with his usual masterly skill, the important relations held by that condition of the blood evinced by albuminuria, whether occasioned or not by pressure of the enlarged uterus upon the kidneys, to the existence and causation of puerperal mania.[3] Esquirol, long ago, called attention to the active effect produced by the inhalation of carbonic acid towards the induction of insanity,[4] and Dr. Workman, in the letter from which I have quoted, speaks of the tendencies toward delirium

[1] Loc. cit., p. 349.

[2] Traité des Maladies Mentales, p. 69.

[3] Clinical Lectures on Diseases of Women, 1863, p. 442.

[4] "We have already seen that those occupations which expose the person to the fumes of charcoal, predispose to insanity. We ought to add, that asphyxia by carbon, is very liable to cause dementia, and that too in its incurable form."—*Mental Maladies*, p. 54.

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in organic pulmonary disease, and the frequency that has been observed of latent phthisis in the insane; points, both of them, that are probably to be explained by deficient elimination of carbon from the blood. It will not be strange, moreover, if it is found that in a similar manner may be interpreted much of the insanity that obtains in women, although I am not aware that this suggestion has before been made. It is well known that there is a close sympathy between the uterine and pulmonary systems, depending in part, it may be presumed, upon the varying quantities of carbon discharged by respiration and through the catamenial fluid. The evidences of this sympathy are manifold, and familiar to every gynæcologist; they are furnished alike in health and disease, explaining many types of the latter that were otherwise inexplicable, and accounting, as, for the first time, I have endeavored to show, for the fact that however dangerous or deadly for the purposes of general surgery, chloroform becomes as safe as ether, to which it is for this purpose so superior, in child-bed, becoming here perfectly innocuous, if properly given.[1]

The so frequent uterine asthma, coincident or connected with the catamenial period, is an instance not irrelevant. I have long believed and taught, that in women the access or progress of pulmonary phthisis is frequently dependent upon and to be controlled by the menstrual condition, and I find that Dr. Workman has announced that more insane women than men die of pulmonary disease,[2] which is so far conclusive evidence.

"It has been noticed," I now quote from Robinson, the physician to the Bensham Asylum at Gateshead, but every one is familiar with the fact, "that among the insane generally, the circulation of the blood is feebly performed, and in melancholia more particularly, the extremities are, from this cause, cold and benumbed, while the surface of the head is often unnaturally heated. Again, in acute mania notably, and also in other recent forms of mental disorder, the quality of the blood is evidently much impaired. Our means of chemical analysis are too crude to enable us to express in scientific formulæ the precise additions and subtractions which constitute this particular cachexia. Suffice it to state that the peculiar odor and the unequivocal symptoms of disordered digestion, secretion, and excretion present in these cases, clearly show that the blood cannot be properly formed and purified, and that its condi-

[1] Eutokia; the employment of Anæsthetics in Childbirth, 1863, p. 20.

[2] American Journal of Insanity, July, 1862.

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tion and quality must therefore be faulty. In some forms of insanity there also exists an unnatural sensibility, or irritability of the mind and nervous system, and, in a certain proportion of cases, violent mental impressions have originally induced the disease.

"Moreover, we occasionally observe in every form of mental disturbance a serious impairment of the innate vitality of the bodily tissues generally, so that a slight bruise or a degree of pressure, which, under ordinary circumstances, would produce no morbid effect whatever, will in the insane be followed by mortification of the parts and ultimate death."[1] This condition, however, is more apt to be the effect of the insanity than its cause.

On the other hand, "it should also be remembered that in many of the insane, in whom there is indisputable lesion of the understanding, the most careful scrutiny will fail to discover any disorder of the circulation, as indicated by the pulse and respiration, or of the functions of secretion and excretion, as indicated by the tongue, alvine evacuation, or the renal secretion. And, with the exception of the class of cases to be referred to, it may be safely affirmed, that among those patients whose moral nature appears to be specially invaded by disease, derangement of the physical health is almost as frequent as among those whose intellect is manifestly disordered. And the termination of cases of moral insanity in some unmistakable physical disease, as general paralysis, will not unfrequently solve any doubt which may have been felt previously, in regard to the disease of one or more of the bodily organs.

"The exceptional class we have spoken of, includes those cases of perverted moral feeling whose history extends back to their earliest infancy, and probably to congenital malformation of the brain,"[2] which, if not of a fœtal character, may be owing to the pressure exerted upon that organ during the latter stage of a difficult labor, or by the application of instruments during delivery.

We are not then to find in diseases of the blood or derangement of its circulation, a causation sufficient to account for all cases of insanity which are ultimately of extra-cerebral origin. We must seek for other methods of explanation, one of which is undoubtedly the hereditary tendency so often recognized, and which may exist under very different circumstances than those ordinarily noticed. Thus, for instance, the mental disturbance may depend not merely,

[1] Prevention and Treatment of Mental Disorders, p. 152.

[2] Tuke, loc. cit., p. 189.

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as I have said, upon the pressure to which the child's head has been subjected during childbirth, a pressure sufficient, in many cases, to effect its death, and in others to produce convulsions or paralysis, either during infancy, or, perhaps, at some long subsequent period; but it may be owing to an effect produced in utero, either by some mental affection, however temporary, of the mother, just as we know such to act, during lactation, upon the nursing infant, or by some functional or organic affection of the placental or uterine system. Upon this point I could say much, but shall content myself by again presenting evidence from Dr. Tuke.

"Should it be said," he remarks, "that disease involves a changed condition or proportion of function or structure in one or more parts of the body, it is to be observed that this change may have taken place at a period when it would escape notice, or even during fœtal life. During the latter period, diminished nutrition of the body, or diminished nutrition of one part and increased nutrition of another, may have occurred, and thus resulted in the production of an undue proportion or predominance of a function. Hypertrophy of some textures has been observed, frequently coexisting with atrophy of others, perverted nutrition being often combined with excessive or defective, and several of these different changes often occurring in succession, in consequence of the operation of the same causes. There is, indeed, during fœtal life—and we may practically widen this period, and say during that which elapses before the character is or can be observed—abundant opportunity for the influence of perverted nutrition; whether it be in the formation of cell-germs, their passage into cells, or the subsequent processes connected with the growth and organization of the tissues; or, again, whether the elements of the circulating blood be in an abnormal proportion; or, lastly, whether it be the mysterious but well-recognized principle, in virtue of which there is an hereditary predisposition to disease, which rules over and perverts the nutritive processes. Thus, in a case of what would probably be regarded as congenital moral imbecility, the mother of the patient was the subject of malignant disease of the uterus during gestation. Now it is possible that this condition of the mother interfered with the proper nutrition of the cerebral tissue of the fœtus, and was one, among other causes, which contributed to the final result. Persons born with talipes, or strabismus, owe their defect to some defect of embryo life. In like manner, during the same period of existence, the brain may

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undergo pathological changes which induce defective mental or moral power."[1]

"The emotional theory, which Bucknill believes to be the true explanation of the metaphysical nature of insanity, goes to prove only this—that emotional disturbance is the frequent source and the constant accompaniment of mental disease. It is so far practical as opposed to the theory upon which the dogmas of courts of law have been founded, that insanity is a perversion solely of the thinking faculties, but it is quite consistent with, and indeed subservient to, the opinion that the proximate cause of all mental disease is to be referred solely to the abnormal state of the brain,"[2] the ultimate cause in many instances having to be sought also in bodily and structural change, but in parts far distant from that organ.

In justice to an earlier author, Pinel, it should be remarked that, however mistaken his views upon the pathology of insanity may have been, they had at least the merit of referring a bodily disease to a bodily origin. In the preface to the second edition of his work, he thus wisely expresses an emphatic condemnation of metaphysical theories on this point: "The most difficult part of natural history is, without doubt, the art of well observing internal diseases, and of distinguishing them by their proper characters. But mental alienation presents new and diverse difficulties and obstacles to surmount, either in the unusual gestures and tumultuous agitations which it occasions, or in a kind of disordered and incoherent chatter, or in a repulsive or savage exterior. If one desires to account for the phenomena observed, one has to fear another rock—that of intermingling metaphysical discussions and divagations of ideology with a science of facts."[3]

He goes still further, and with an acumen that in view of the limited method of diagnosis at that time well known, he foreshadows the great theory of a frequent pelvic origin, for he refers the primitive seat of mania "to the region of the stomach and intestines, from whence, as from a centre, the disorder of the understanding is propagated by a species of irradiation. A feeling of constriction, &c., manifests itself in these parts, soon followed by a disorder and trouble of ideas."[4] In that day, it will be remembered, the methods, by which at the present time the differential diagnosis of most of the diseases of the abdomen is so clearly and so easily established, were in practice almost wholly unknown.

[1] Tuke, loc. cit., 186.
[2] Ibid., p. 447.
[3] Ibid., p. 394.
[4] Ibid., p. 393.

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We have thus been brought to the doctrine that mental disturbance may be occasioned secondarily and reflexly, by sympathy with disturbances of other organs than the brain. Let us listen upon the general subject, to Dr. Bucknill.

"That the organ of the mind is thrown into diseased action by sympathy with, that is, by suffering with, other diseased or injured parts, is scarcely less certain than that the stomach, the heart, or the spinal marrow, are so affected. The modus operandi of this cause of disease is by no means clearly intelligible, either in relation to the brain or to other organs; the explanations usually offered being little more than diversified verbal formularies of the fact. Thus, when we say that the irritation of the cervix uteri is reflected upon the stomach, occasioning vomiting and distress in that organ, we come no nearer to an explanation of the mode of action than when we say, that the stomach sympathizes with, or suffers in conjunction with, or in consequence of, irritation of the organ first affected. And, in like manner, when we say that the brain suffers sympathetically with the uterus or stomach, we use a mere verbal formula for the colligation of two facts, with the intimate nature of whose connection we are wholly unacquainted. The knowledge which we actually possess on this subject may, in general terms, be thus stated: the most important organs of the body are liable to be thrown into states of functional disturbance by irritation or injury of other, and frequently of distant parts. The liability to this disturbance depends, in the first place, upon what is called constitutional irritability, or a state of the system in which slight causes of nervous action produce great effects; and, in the second place, upon the intimate connection of the organ secondarily affected, with the nervous system, and its liability to be thrown into disorder by any alteration or disturbance in the state of that system. Any premature attempts to explain this important pathological fact by hypothesis, respecting nervous currents, or the exhaustion of nervous power, seem at present rather likely to obscure than elucidate the matter. We may, however, come one step nearer to the view of the fact, by considering all sympathetic disturbance as taking place in the nervous system itself; and in viewing the functional disturbance of secreting and other organs, as merely the expression of abnormal states of the nerves in those organs. Strictly speaking, therefore, sympathetic vomiting or palpitation is as purely a nervous phenomenon as loss of conscious-

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ness or convulsions; and the latter, as mental excitement or delusion.

"In early life, the cerebro-mental functions are more intimately connected with those of the spinal system than at subsequent periods, and distant irritations are more frequent and efficient causes of mental disturbance in the infant than in the adult. Delirium and coma are, in children, frequently produced by intestinal irritation. In the adult, in comparison with convulsions, delirium is so rarely a consequence of simple irritation, that it furnishes one strong proof that the brain proper exercises its functions with great independence of the excito-motory or spinal system. The most frequent and unquestionable instances of cerebral disturbance from distant irritation or sympathy, are afforded in epilepsy and hysteria. In both of these diseases the paroxysm is compounded of disturbance both of the cerebral and spinal functions; but during the interval, cerebral disturbance alone is frequently present, and in the paroxysm itself it is never wanting. In epilepsy, especially, is this the case; for loss of consciousness, which is the primary and leading feature of the paroxysm, is the most serious and profound indication of cerebral disturbance, no less, in fact, than the temporary abnegation of all cerebral function. In hysteria, loss of consciousness is of less certain occurrence, although sometimes it is doubtless complete. In the interval of hysteria, however, cerebral disturbance is not less marked than in epilepsy. The emotions are perverted, and even delirium is by no means uncommon. Now both of these diseases are frequently but the expression of sympathy with irritation of distant parts of the nervous system. The one is produced by irritation of the nerves of the uterus and its appendages, and the other by the irritation of almost any portion of the peripheral nerves, by worms in the intestines, renal calculus, painful injuries, and diseases of the limbs, &c. Therefore these diseases present unquestionable instances of mental disturbance, occasioned by sympathy of the brain with irritation of the distant nerves; of the central organ of the system, suffering in its noblest functions, in sympathy with some fibres of its peripheral extension.

"The most probable explanation of these sympathetic disorders is, that injury to one part of the nervous system interferes with the processes of secondary nutrition taking place in other parts. The rapidity with which they occur may, at first sight, seem adverse to this view; for instance, in the case related by Dr. Gooch, and so familiar to psychologists, where Dr. Denman passed

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a ligature round a polypus of the fundus of the uterus, as soon as he tightened it, he produced pain and vomiting. As soon as the ligature was slackened the pain ceased; but whenever he attempted to tighten it, the pain and vomiting returned. The ligature was left on, but loose. The patient died about six weeks afterwards, and, on opening the body, it was found that the uterus was inverted, and that the ligature had included the inverted portion. Sympathetic disturbances of the functions of the brain are, in some instances, scarcely less rapidly occasioned, or capable of receiving more immediate relief. Thus the irritation of a cutting tooth will sometimes produce in a child delirium and coma; and the removal of the irritation, by incision of the inflamed gum, will remove the symptoms almost as speedily as in the examples above quoted. But when it is considered that the processes of secondary nutrition are those upon which the functions of all organs immediately depend, and that any interference with these processes must necessarily and immediately disturb the normal course of the functions, the short interval which is frequently observed to exist between the production of irritation and its sympathetic consequences will present no difficulty to the theory which explains the latter in the manner here suggested. In our present state of ignorance of the manner in which influences are communicated from one part of the nervous system to other parts, it is impossible to explain how the processes of secondary nutrition in the nervous structure are interfered with in distant parts thereof. But this difficulty scarcely diminishes the probability that the explanation offered is the true one; and, indeed, only presents one of those imperfect links in reasoning, which the immaturity of physiological science renders of such constant occurrence in all departments of medicine. The operation of remedies is consistent with this view of sympathetic disturbance, since those narcotic substances which retard the processes of waste and repair in the nervous system afford the most efficient means of preventing the nervous function from suffering in consequence of peripheral nervous injury. Moreover, this view of pathological sympathy is consistent with the only rational view of physiological sympathy. Secretions are the result of secondary nutrition. Many secretions are normally excited by the irritation of nerves more or less distant; that of the mamma, for instance, of the testis, and, to some extent, of the gastric glands. Here, then, at least, are processes of secondary nutrition, energetically influenced

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by the irritation of distant nerves."[1] Marshall Hall himself could scarcely have afforded us a juster and more thorough argument for all the effects I have claimed, of pelvic agencies as ultimately causing insanity in women, than the remarks above given.

It has been argued that those of us who see in reflex action an explanation of what would be otherwise inexplicable anomalies, must be in error on the ground that, by allowing a distant lesion ever to produce disturbance of the brain, we ought always to find an identical effect from a similar cause. The fallacy of such an expectation has been commented upon by Dr. Williams in the following language, equally applicable to congestion and other morbid conditions of the brain.

"Congestion of the liver is sometimes accompanied by pain or tenderness; sometimes it is without either. Congestion of the stomach sometimes causes gastralgia, nausea, and vomiting, with altered appetite; but these symptoms are often absent when the amount of disease of the liver, or the heart, and the subsequent occurrence of hæmatemesis, leave no doubt that the stomach was congested. The same remark is applicable to the kidneys, the uterus, the brain, and other organs."[2]

On the other hand, that in cases where mental disturbance is thus induced, it should often be extreme, varying alike in its type, its symptomatic characters, and its degree of intensity, is only what should *à priori* have been expected. Dr. Bucknill has clearly recognized this fact, and admits that the analogy from an organ whose function is simple, to one whose function is so complex as that of the brain, can afford but a slight insight into the effect of similar pathological conditions in the two instances. Of the abdominal and thoracic organs, the stomach is that whose functions are the least simple. Its muscular movements are as ingeniously adapted to an end as those of the heart; they are even more complicated and less mechanical. In addition to this, the functions of secretion and absorption, discharged by its several sets of glands, add to the complexity of its duties. Congestion, as we have seen, causes irregular excitement or depression of all its functions, nervous, muscular, and secretive; yet, compared with the brain, how few and simple are its duties. The functions of the organ of the mind are more numerous than those of all other parts of the body put together; nor less distinct in themselves and inter-distinct in

[1] Loc. cit., pp. 382–385.

[2] Principles of Medicine.

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their action. Consequently, any pathological state which destroys their equilibrium, producing irregular depression of some functions, with irregular excitement of others, must cause a wider and more intricate range of anomalies than is observable in a similar state of the more simple organs.[1]

It is necessary to distinguish the distant affections which cause insanity from those that merely accompany or result from mental disturbance. I have already referred to Dr. Workman's estimate of the frequency and importance in the insane, of pulmonary phthisis, here so often latent or unnoticed, even to its extreme stages. The Physician of the Devon Asylum would explain this and similar affections in the insane as follows:—

"Diseases of the lungs occur in the insane in all their varieties. They are frequently latent from the absence of cough and the patient's absorption of mind preventing complaint. The absence of cough in serious pulmonary disease is very peculiar. In dementia, it arises partly from torpor of the excito-motory system, partly from loss of attention; from the same cause, in fact, as the frequent dirty habits of the insane. In mania, it arises from the attention being intensely pre-occupied by the vivid ideas and delusions which absorb the mind. We have seen many patients in advanced stages of phthisis, who were never heard to cough so long as they were under the influence of maniacal excitement. When this underwent a temporary diminution, they were greatly troubled with cough, which was again arrested by the recurrence of excitement. The continuance of colliquative diarrhœa and perspiration, and of emaciation, proved that there was no halt in the progress of the disease, as the absence of cough has led authors erroneously to suppose. The torpor of the nervous system in dementia leads to another peculiarity in the lung and in some other bodily diseases of the insane, namely, the absence of irritative or symptomatic fever; and hence it happens, that in a demented person whose strength is unimpaired, and whose constitution is tolerably good, diseases will obtain a high degree of development, with symptoms so few or obscure as to be incredible to the general physician. It is on this account that the numerous sloughing sores to which general paralytics are liable, produce so little suffering or constitutional irritation. We have known the stomach disorganized by cancer, without the patient complaining of any pain until

[1] Loc. cit., p. 359.

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a few days before death, when perforation took place. The only case of true carditis we ever saw, occurred in an insane person who complained of no pain, and in whose heart disease was only suspected twenty-four hours before death, in consequence of the failure of the pulse. This peculiarity in the intercurrent diseases of the insane should teach the physician to observe with watchful anxiety every physical indication from which he can derive knowledge of the attack of disease before it is so advanced as to be beyond control. Pulmonary gangrene is more common among the insane than the sane; but not to the same extent here as at Vienna, where it contributes largely to asylum mortality."[1]

To my own mind, it would be more scientific and in accordance with facts to explain the non appreciation of pain in the insane by a true state of general or local anæsthesia, a temporary and intermittent, or confirmed and permanent, paralysis of the nerves of sensation, local and limited or general as this may be, than to attribute it merely to lack of notice of the suffering, in consequence of pre-engagement or pre-occupation of the mind. That I am correct would seem to be shown, moreover, by the curious fact that there is often absent in the insane the febrile excitement and reaction, both nervous and arterial, that usually attend physical accident or disease. That intervals may occur, in which the patient becomes acutely sensible of bodily anguish, only implies that æsthesia or even hyperæsthesia may succeed to local or general anæsthesia, just as undue mental activity may at times alternate with apathy or even dementia itself.

VI.—CAUSATION OF INSANITY OFTEN PELVIC IN WOMEN.

I have claimed that while there were affections of many organs in the body in both sexes, that were underlying insanity, in reality its cause, the foundation upon which it rests, in women there is a depth beyond—a source of excitation not existing, practically, in man—for, allowing every latitude to the influence of the sexual system in the male, it must be allowed that in him the genital apparatus is merely subsidiary, and playing but an occasional and comparatively a very insignificant part in its relations to the general economy.

In woman, the case is very different—not only is she subject to

[1] Loc. cit., p. 433.

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a host of diseases peculiar to her sex, to which we find neither homologue or analogue in man, but they are capable of so modifying herself as entirely to change her natural disposition and character. In health we find her still obedient to a special law. The subject here also, we might even say the victim, of periodicity, her life is one perpetual change, and these changes even are still again subdivided.

The uterus and appendages that, in the female embryo, while yet unborn, were being developed *pari passu* with the other organs of the body, become at birth arrested in their growth; without other change than a slight and disproportionate enlargement in size, they remain in their fœtal condition until puberty is established. The child has now become a maiden. Immediately the emotions, desires, and passions that, though latent, have been gradually foreshadowing themselves, are now established, unrecognized though it may be by the girl herself; yet, like the smouldering fires of a volcano, ready to burst forth at any exciting moment. The short space of a lunar month is henceforward the field, for many years, of a triple change—preparation for ovulation, the discharge of a germ fit for impregnation, rest, and recuperation. The instinctive yearning for the other sex, and its gratification in the excitement of coitus, the culmination of sexual congress in effectual impregnation, are surely affairs of no little import, and affairs of constantly recurring occurrence, both in the married and in many of the unmarried, unless, as is too often the case, they are interfered with by preventive or subversive measures, which may but increase their effects upon the woman's system by making them prejudicial rather than, as otherwise, of benefit. Pregnancy with its varying fortunes, child-bed and lactation, and, finally, the grand climacteric, supervene, and a return to the second sexual childhood, which, though barren of further fruit to the womb, is yet by no means past desire and attempts at its gratification, or past uterine disease and its many dangers; with this the scene is closed.

To man, these changes, these excitements, this special work, these diseases, these dangers, are all unknown. Why, then, is it called preposterous to seek in her sex the abstract fundamental influence impressed upon every woman, even while an infant in her mother's womb—the solution of much to which otherwise we have no key? Van Helmont was not far wrong when he contended that woman was what she is, in health, in character, in her charms, alike of body, mind, and soul, because of her womb alone.

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Nor am I so far wrong, I candidly believe, in attributing the major part, not all, of her characteristics in disease, mental as well as bodily, also to this self-same womb. Just as we have special diseases of the pelvic organs in the female, so we may have functional diseases of the brain, of many and deceptive types, excited in her thereby; and just as we may have other disease in woman, whether general in its character or of other than uterine localization, pulmonary, cardiac, renal, or hepatic, as the case may be, idiopathic in its inception, yet materially modified by the influence of the sexual system, even so there may exist states of mental disturbance in which we may recognize an originality of causation in the brain itself, but yet such an effect from a special physiological or pathological condition of the uterus or ovaries that may be present, as to require special examination, special consideration, and special treatment. To the gynæcological expert, these facts will be self-evident. I have found that to some psychological experts, they have not been so. As my object is merely to change to a more rational system, the present private and public treatment of so many of the most interesting of patients, now practically untreated at all, I shall again present the testimony of psychologists rather than my own. In my previous writings I have contended that the principles to which I had called attention have long been known, though in practice constantly unappreciated or forgotten. I shall now go farther, and by the testimony presented, which is but a little fraction of that I now have at hand, show, as I think, conclusively that, in longer refusing for the female insane that study, special examination and treatment without which, in all other forms of disease, women cannot be properly cared for, any person laying claim to the honorable office of physician must be deemed guilty of gross neglect, blindness from too great conservatism, or inhumanity. This is strong language; it is not intended as personal, however. I am but working for a general principle in one of the many fields of its application, and in behalf of the sex to the alleviation of whose sufferings some of us are devoting our lives. Should controversies be attempted to be forced upon me, as has already been the case in the discussion of this question, it is to the good sense and wisdom of the profession that I shall again appeal.

I cannot do better, at this point of our inquiry, than introduce the testimony of a gentleman at present, or very lately, connected with the Utica Asylum.

"When we contemplate the reproductive system, whether in

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health or disease," says Dr. Kellogg, "in its relations to the cerebral system and to psychology, we are forcibly struck with the paucity and imperfection of our knowledge. The recorded facts which bear upon the reciprocal influence of these systems are widely scattered, and the attempt to collect, digest, and systematize them, and make the necessary scientific deductions, would be a work of some importance.[1]

"The influence of excessive and unnatural excitement of the sexual organs upon the mental faculties," he continues, "has long been recognized. In tables setting forth the supposed causes of insanity, this has long occupied a prominent place, and though its influence as a cause of insanity has no doubt been overrated (or misinterpreted, in the absence of physical examinations in women, —H. R. S.), still it is undoubtedly great.[2] Of the probable causes of derangement in three hundred and sixty-six cases of insanity, occurring in both sexes—as recorded in the report of the superintendent of the New York State Lunatic Asylum, for the year 1852—eighty-seven, or nearly one fourth of the whole number of cases, are reported to have arisen from causes directly connected with the reproductive system. In the report of the superintendent of the same institution for the year 1853, of the supposed causes of insanity in four hundred and twenty-four cases, one hundred and seventeen, or more than one-fourth, appear to have had direct connection with some disturbance of the sexual organs. In the able and interesting report of Dr. Gray to the managers of this institution, for 1853, of three hundred and ninety cases, seventy-two are supposed to have had some direct connection with derangement of these organs. From the above it would appear that in nearly one-fourth of all the cases of insanity, occurring in both sexes, the disturbance of the generative organs was so marked as to be regarded as a primary cause of the mental derangement.

"Whether the primary cause in these cases had its seat in the cerebral or the generative system, is a question no less interesting than difficult of solution, and one which could only be determined by an attentive consideration of the history of the cases reported, and a close observance of the true sequence of the symptoms in each, and, whether the primary link in the chain of morbid sym-

[1] Considerations on the Reciprocal Influence of the Physical Organization and Mental Manifestations.—*Amer. Journal of Insanity*, April, 1856, p. 305.

[2] See the testimony of the late Dr. Brigham in the Philips' Will case.—*Amer. Journal of Insanity*, vol. vi. p. 182.

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pathies had its seat in the one system or the other, it is none the less important in relation to the reciprocal influence of the two.

"As the functions of the reproductive system are far more important and intricate in the female than in the male economy, and as the pathological disturbances are, as a natural consequence of this, more frequent and interesting, we are, as a matter of course, to look to the female generative system for the most important illustrations of the sympathetic disturbances and reciprocal influences dependent upon these pathological lesions. Hence, all the diseases which affect the female generative system have, at one time or another, been brought forward as causes of insanity. Even its most natural function, that of gestation, does, in some cases, by the peculiar change wrought in the female economy, and the train of inexplicable symptoms which result, give rise to insanity; and there are cases on record, of females who have been positively insane during the whole of each period of utero-gestation, but who recovered their mental health and strength soon after delivery. The cases in which some slight mental or moral disturbance during gestation has been observed are numerous; there are many on record, and every experienced practitioner is able, no doubt, to recall to mind such slight disturbances.

"The influence which the menstrual function, even when performed apparently in a healthy manner, exercises upon the mental faculties and moral feelings of some females is exceedingly interesting to the intelligent and philosophical observer. In certain abnormal states of this function the influence is still more apparent. I have been told by intelligent females, accustomed to analyze their own feelings, that they felt far less mental energy during this state than in the intervals, and that they possessed far less control over the moral feelings than at other times, were more easily excited, and that the most trifling circumstances, which at other times would pass unheeded, have, in spite of every effort, greatly disturbed their equanimity. In some whom I have known, of a nervous, excitable temperament, their whole character appeared changed during the menstrual period, and from being cheerful, kind, firm, patient, and decided, they became morose, taciturn, wayward, fidgety, and impatient, frequently manifesting a certain nervous irritability bordering on hysteria, and were sometimes overcome by paroxysms of that interesting affection.

"The changes which take place in the mental and moral faculties about the time of puberty, are in both sexes very interesting, par-

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ticularly so with the female. These have been frequently alluded to by medical writers, as attendant upon a fuller development and higher manifestations of vitality in the sexual organs. During these changes the nervous system exhibits increased susceptibility and sensibility; and not only the whole frame, but also the mental manifestations, present greater activity of development." "The mind," says Dr. Copland, "acquires extended powers of emotion and passion, and the imagination becomes more lively. If, on the other hand, the uterine organs continue undeveloped, and the menstrual discharge does not appear, the mind is dull, weak, or depressed, and the emotions and passions are imperfect or altogether absent."[1]

"The young female," resumes Dr. Kellogg, "who, up to the time of these changes, has appeared, comparatively speaking, a non-sexual being, in her intercourse with her companions, playing in childlike innocence and unrestrained freedom with the opposite sex as with her own; ignorant and unconscious of the powers within her, which are soon to be awakened from their slumbers, begins, as she now approaches the verge of womanhood, to be animated with feelings and desires to which she was before a complete stranger, and which she regards with a deep interest as the forerunners of something, she scarcely knows what, which she feels inclined to cherish, yet shrinks from, as though she knew not whether they were of good or evil omen.

"In her intercourse with her former playmates of the opposite sex, there appears gradually to have dawned upon her an interesting shyness and maidenly reserve. Expressions which before conveyed no meaning to her pure mind, and which even now are but partially understood, are yet sufficiently so to tinge her cheek, and cause her to shrink back instinctively, as from some foul and pestilential presence. Her likes and dislikes are stronger, and rendered more apparent to those around her. In short, the physical changes brought about in a limited period of time in the sexual system have wrought a complete change in the mental and moral character of the young girl, and this period of transition terminates in that of complete womanhood, with all its desires and its aspirations, its hopes and its fears, its joys and its sorrows.

"But it is in connection with the various diseases incident to the female generative system, that we are to look for the more curious

[1] Dictionary of Medicine, art. Menstruation, vol. ii. p. 959.

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illustrations of this cerebral sympathy. The abnormal mental state of many patients laboring under hysteria, menorrhagia, dysmenorrhœa, amenorrhœa, and the affections intimately associated with uterine derangement has long been observed by medical men." "In at least three cases out of four," says Dr. Francis, "I have found hysteria associated with uterine derangement, and the restoration of the menstrual function to its healthy state has proved the precursor of the removal of the hysterical annoyance." Hysteria, again, may manifest itself chiefly by disorder of the mental faculties, and the moral feelings and emotions. "The mental affections," observes Dr. Copland, "connected with hysteria may be referred, 1st, to certain states of monomania, among which excited desire, amounting in some cases to nymphomania, may be enumerated; 2d, to ecstasies and mental excitement, in some cases of a religious nature, in others of different descriptions; 3d, to a state of somnambulism; 4th, to a form of delirium, generally of a lively character, with which various hysterical symptoms are often conjoined; 5th, to various delusions, generally of a hypochondriacal kind, to which the patient may become subject or even the victim, owing to the indulgence she may meet with from imprudently kind relatives; and 6th, to a desire to feign various diseases, sometimes of an anomalous or singular form."[1]

The subjoined remarks of this same acute and philosophical physician are so apposite that we cannot resist the temptation to transcribe them in this connection. "Hysterical females," says he, "are not merely capricious or whimsical, but they often become enthusiastic for a time in the pursuit of an object, or in cherishing an emotion by which they have been excited. In many such cases the nervous excitement and vascular turgescence of the uterine organs determine the character of the mental disorder; elevating certain of the moral sentiments, or of the intellectual manifestations, to a state of extravagance, passing in some instances into delusion or monomania. Many cases of puerperal mania are merely extremes of the hysterical disorder of the moral and intellectual powers or states of the mind. All these more extreme forms of mental affection are observed only where, in connection with much local or uterine irritation, there is great deficiency of nervous energy generally, and of mental power in particular; or where, with such deficiency, there has been much injudicious culture or

[1] Loc. citat., vol. ii. p. 321.

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perversion, or improper excitement of the imagination. Females sometimes become passionately attached to an object, and this passion may advance even to nymphomania or monomania.

"The hypochondriacal feelings, the desire to deceive, or to simulate various diseases, or the delusions which sometimes possess the minds of hysterical females may be classed with the foregoing, as requiring a similar plan of treatment. In all of them the intentions of cure are to remove irritation or vascular turgescence of the uterine organs; to improve the general health; to strengthen the nervous system; to calm the imagination; and to guide the moral impulses of the patient. The most efficient, however, of these means are not likely to be adopted by the patient. Few will resort daily to the shower-bath, or even occasionally to terebinthinate enemata, or submit to a course of tonics, or to a suitable regimen, &c., while they believed their health but little affected. Even when the hysterical disorder is of a very painful kind, the variability or capricious state of the patient's mind leads her to run from one physician to another, before opportunity of administering aid is afforded to any. At last, the most notorious charlatans, particularly those who excite the body through the mind or the mind through the body, the animal magnetizers, the homœopathists, the St. John Longs of rubbing celebrity, and the Campbells of celestial-bed notoriety, fix her attention. At such medical bagnios there is something promising gratification as well as excitement, and at such places, hysterical as well as hypochondriacal patients 'most do congregate.'"[1]

"When we pass from the consideration of the influence of the reproductive system upon the cerebral, to take a view of the influence of the latter upon the former, we enter upon an inquiry possessing as profound an interest as any in the whole domain of science; and here again, as before, we have to look to the female economy for the most interesting facts and phenomena illustrative of this mysterious and inexplicable sympathy. The results of this influence, if we allow ourselves to believe the statements and receive as evidence what is brought forward as fact in illustration of it, are, indeed, sometimes most extraordinary; and the unmistakable evidence of this which is from time to time presented to the medical observer is sometimes so curious as to make him pause before rejecting, as the workings of a morbid imagination, the

[1] Copland, loc. citat., vol ii. p. 337.

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statements which are sometimes made by intelligent females, whose veracity we cannot doubt, and whose motives for deceiving us we are unable to discover.

"There are few physicians of experience who will not be able to call to mind some extraordinary statements made to them by females in reference to this sympathy, which at the time, no doubt, merely called forth a smile of incredulity or surprise at what was then regarded as the result of superstition, or of a morbid imagination, but which, in after hours, has been seized upon by him as food for reflection."[1]

To these remarks of Dr. Kellogg, there would be little need of adding, had they but been practically accepted and acted upon. Such, however, has not been the case; nearly ten years have elapsed since their publication, and, as yet, in the reports of no asylum do we find a change, either in the method of tabulating cases, of specifying causes, or of treatment. The organ of psychologists in this country, the *American Journal of Insanity*, generally so ably conducted, in which Dr. Kellogg's paper appeared, and which emanates from the asylum with which he is connected, still ignores the conclusions he had advanced, as shown alike in its editorial papers and in its comments, or absence of comments, upon those by others, admitted to its pages. I need adduce but a single instance. Sir Wm. Hamilton, in his celebrated work upon metaphysics, makes use of the following language: "A fact striking in itself," he says, "and not without significance in relation to the present inquiry, is this, that these intruders (parasitic animals of various kinds, worms in every loathsome diversity, reptiles armed with fangs, crawlers of a hundred feet, &c. &c.) infest the (frontal) sinuses of women." This statement, so strange and astonishing as regards its application to most women, sane or insane, was reproduced in the *Journal* referred to, by a reviewer of Hamilton, but five years ago, without a word of contradiction.[2]

While a single fact like the above can take place, a single assertion of that character pass unchallenged alike by the *Journal* and the profession at large, it cannot be argued either that the conclusions presented in this report are generally known and acted upon, or that the investigation is one without a very plain and practical end.

The notion that her sex plays an important part in the causation

[1] American Journal of Insanity, April, 1856, pp. 306–10.

[2] Ibid., June, 1860, p. 255.

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of insanity in women, is by no means a modern one; like many of the most valuable theories of medicine, it dates back to remotest antiquity.

Aretæus, of Cappadocia, held that a frequent cause of mania was to be found in suppression of the menses, or difficulty in their establishment in young women, who needed only this condition of marriage.[1]

Soranus enumerates, among other causes, the long use of medicines that excite the genital organs in women, and the suppression of their periodical discharge.[2] Before the expedition of the Argonauts and before Hippocrates, it is said that the daughters of King Prœtus, whose savage lowings[3] remind one of certain historical and modern epidemics of insanity complicated with hysteria, were cured by means of hellebore, which was then supposed to exercise a peculiar influence upon the uterus.[4] The theory of pelvic causation, like all others, however good, did not even at that early period escape criticism. Cœlius Aurelianus, for instance, affirmed that women were less subject to insanity than men, but his reviewers and admirers of more modern times, and at the present day, however they undertake to explain the fact, yet think that he was mistaken. This statement is true of Esquirol, Copland, Brown and many others, some of whom I shall hereafter quote. Thus, Dr. Haslam has averred, speaking of England, that "in our own climate, women are more frequently afflicted with insanity than men."

On the other hand, to bring this disputed question down to the present moment, Dr. Thurnam, in his paper upon the relative liability of the two sexes to insanity, expresses himself as follows: "Having thus shown that in the principal hospitals for the insane in these kingdoms, the proportion of men admitted is nearly always higher, and, in many instances, much higher than that of women, and as we know that the proportion of men in the general population, particularly at those ages when insanity most usually occurs, is decidedly less than that of women, we can have no ground for doubting that men are actually more liable to disorders of the mind than women."[5] Dr. Bucknill, also, is of opinion that it is clearly proved that, in general, fewer women become insane than men.[6]

[1] Trélat: Récherches Historiques sur la Folie, 1839, p. 12.
[2] Morel: Traité des Maladies Mentales, p. 4.
[3] "Prœtides implerunt falsis mugitibus agros." Ibid., p. 19.
[4] Griffith: Medical Botany, p. 86.
[5] Quarterly Journal of the Statistical Society of London, December, 1844.
[6] Loc. cit., p. 245.

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Upon this side the water, this question of the comparative liability of males and females to insanity, has been carefully investigated by Dr. Edward Jarvis, in a paper published in the *Journal of Insanity* several years since. He also has arrived at the conclusion that males are somewhat more liable to insanity than females.

There are, it will be perceived, several very different questions here involved, as the following:—

1st. Do more women, abstractly, than men become insane?

2d. Do more women become insane, in proportion to the number of each sex existing in a given hospital, city, state, or country?

3d. Do more women than men become insane from sexual causes?

The latter question, it will be perceived, is the only question that concerns us in the present inquiry. It is to the two former, however, that attention has generally been given. As the attempt at their solution, though this must evidently be almost impossible, has been made, I will give it a moment's notice. Dr. Bucknill has admitted that there are many points that observers have practically lost sight of.

"Sufficient care," he says, "does not appear to have been taken to ascertain the relative number of males and females in the general population, a point obviously necessary to determine, before any just conclusion can be drawn as to the relative liability of the sexes to insanity. Writers upon the subject have found the existing number of female lunatics greater than that of the males, and hence, have arrived at the conclusion that the female sex is more subject to insanity than the male. Dr. Thurnam, however, has pointed out this source of fallacy, as well as that which arises from the fact that the mortality of insane men exceeds that of insane women by 50 per cent. Hence, it is obvious that Esquirol erred, in comparing the existing instead of the occurring cases of insanity in the male and female sexes. If, in our asylums, women live longer than men, they will of course proportionately accumulate."

"In order that the comparison of the occurring cases be a strictly accurate one," observes Thurnam, "the proportions of the two sexes at the several ages, attacked with insanity for the first time, should be compared with the proportions in which the two sexes at the same ages exist in the community in which such cases occur. The nearest approximation to this method which we have the means of employing is, by assuming that the proportions of men and women admitted into public institutions during extensive

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periods represent—as, on the whole, they probably do represent—the cases which occur for the first time."

"From an examination of a table prepared by this writer, it was ascertained that, in twenty-four of the thirty-two asylums, which it comprises, there had been a decided excess of men in the numbers admitted. In many British asylums, the excess amounts to 25, 30, and even 40 per cent., and, in the whole number of thirty-two asylums, there is an average excess on the side of the male sex of 13.7 per cent. In the nine English county asylums contained in the table, the excess amounts to 12 per cent.

"From the same tables, it appears that, in the asylums of the metropolis, the proportion of females admitted is much greater than in the provinces. This appears to be in part accounted for by there being a considerable excess per cent. (13 per cent. at all ages, and 19 per cent. at all ages above 20) of women over men in the metropolis.[1] Hence, the experience of Bethlem and St. Luke's led Dr. Webster to the conclusion, that no doubt can exist regarding the greater frequency of mental alienation among females than males. Dr. Thurnam appears to regard it as probable, that the statistics of insanity in France resemble in this particular those of London, although, as has been pointed out, the method of inquiry adopted by Esquirol was vicious.

"Jarvis has shown," continues Bucknill, "that the causes of insanity which act upon males are more extensive than those which act upon females, and has added that the above statement, in regard to the liability of the sexes, must vary with different nations, different periods of the world, and different habits of the people.

"It would be difficult to establish that the female sex is intrinsically less susceptible to the causes of insanity than the male, since the former is less exposed to those causes than the latter; at least, to establish the greater intrinsic liability of females, it must be shown that they are exposed to the predisposing and exciting causes of insanity to as great an extent as males."[2]

In this connection, as in many others, it must not be forgotten that the statistics of the insane, whether derived from hospitals

[1] On the other hand, in some parts of this country, in Massachusetts for instance, the excess of women is much greater than in London, being estimated of late at 50 per cent. or even higher, and yet there seems to be no proportionate excess of female admissions at asylums.

[2] Loc. cit., p. 245. This last sentence is expressive only of Bucknill's opinion; I think it will appear that women are exposed constantly to the action of these causes to a greater extent than are men.

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or from the general population, are very liable to be faulty or to give rise to erroneous conclusions. I shall subsequently give evidence to this effect, and the opinions of Luther V. Bell and others; here merely asking,

"What can be the value of medical statistics in any disease, under which sixty per cent. of the entire cases must be left unaccounted for? Probably too, not five out of twenty of the assigned causes are justly chargeable with the mental disease ascribed to them."[1]

In the present instance, writers seem to have lost sight of the facts that in almost all countries more males than females are born; that this percentage of excess, which would be very much greater were all the males that are conceived born living, is to a certain extent kept down by the number of boys who die in infancy and during childhood in consequence of various affections to which the comparatively larger size of the head in the male fœtus has given rise, from the greater pressure to which it was necessarily subjected during parturition;[2] and that in this same excess of cerebral com-

[1] Workman: Report of the Provincial Lunatic Asylum at Toronto, 1863, p. 5.

[2] Dr. Simpson, in his memoirs upon the sex of the child as a cause of difficulty and danger in human parturition, has shown conclusively, that—

1. Of the mothers that die under parturition and its immediate consequences, a much greater portion have given birth to male than female children.

2. Among labors presenting morbid complications and difficulties, the child is much oftener male than female.

3. Among the children of the mothers that die from labor or its consequences, a larger proportion of those that are still-born are male than female; and, on the contrary, of those that are born alive a larger proportion are female than male.

4. Of still-born children, a larger proportion are male than female.

5. Of the children that die during the actual progress of parturition, the number of males is much greater than the number of females.

6. Of those children born alive, more males than females are seen to suffer from the morbid states and injuries resulting from parturition.

7. More male than female children die in the earliest period of infancy, and the disproportion between the mortality of the two sexes gradually diminishes from birth onwards, until some time subsequently.

8. Of the children that die in utero and before the commencement of labor, as large a proportion are females as males.

9. In laborious labor with the head presenting, in proportion as the order of labor rises in difficulty, the amount of male births in them rises in number.

10. Of the morbid accidents that are liable to happen in connection with the third stage of labor, after the head has passed the brim of the pelvis, as many take place with female as with male births.

11. More dangers and deaths occur both to mothers and children in first than in subsequent labors.

12. The average duration of labor is longer with male than with female children. —*Obstetric Works*. Ed. by Priestley and H. R. Storer. Edinburgh edition, i. p. 394.

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pression, is undoubtedly to be found an efficient cause of insanity in man in after life. This point does not appear to have been before observed. It has also been forgotten that males everywhere, save perhaps in the most crowded cities, are much more likely than women to be carried from home and the care of relatives to the seclusion of an asylum; that in women, the attacks are more seldom persistent, more frequently intermittent, paroxysmal, periodical, and therefore more likely to be endured by friends, and to be more constantly looked upon as they are, as merely hysterical, nervous or feigned, while no one at all familiar with the subject would undertake to prove, as Bucknill has supposed possible, that women are intrinsically *less* susceptible to the same causes of insanity that affect men. On the contrary, we would claim that these very productive and efficient causes do act, so far as women are exposed to them, and a thousand-fold more besides.

It has been supposed that moral influences, and those purely mental in their character, have exercised an important part in the causation of insanity. In the case of women, in the absence of a predisposition to insanity by inheritance, I believe that these moral causes seldom efficiently act unless in the presence of physical disturbance.

Be this as it may, much attention has been paid by psychologists to the classification of these alleged moral excitations. Thus Tuke, from an analysis of some thirty thousand cases, admitted into a large number of asylums in England, France, and America, found that among them domestic troubles or grief stand first in the list in every instance; next in order, religious anxiety or excitement; then disappointed affections, political and other excitements, fear and fright; and lastly, excessive study and wounded feelings, as impaired self-love, &c.[1] There is, of course, no doubt that men are more exposed than women to political excitement and the harassing anxieties of business; but these we find Esquirol considering as more than counterbalanced by the vices of female education; the preference given to acquirements purely ornamental; the reading of romances, from which arises a precocious activity of the intellect and premature desires, together with ideas of an imaginary excellence that can never be realized; the frequenting of plays and society; the abuse of music and the want of occupation—these, he thinks, are causes sufficient to make insanity most frequent among women.[2]

[1] Manual, &c., p. 258.

[2] Mental Maladies, p. 235.

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Dr. Conolly, of the Hanwell Asylum, but reiterates this opinion when he says that "All who have peculiar opportunities of ascertaining the mental habits of insane persons of the educated classes well know that, with some exceptions, their previous studies and pursuits appear to have been superficial and desultory, and often frivolous; the condition of the female mind, especially of the minds of those who are to be the mothers of another generation, is, even in the highest classes, too often more deplorable still. Not only is it most rare to find them familiar with the best authors of their own country, but most common to find that they have never read a really good author, either in their own or in any other language; and that the few accomplishments possessed by them have been taught for display in society, and not for solace in quieter hours. All this has been said before, and often, and in vain. But there is a frequent perversion of intellectual exercise more fatal than its omission, and which fills asylums with lady patients, terrified by metaphysical translations, and bewildered by religious romances, and who have lost all custom of healthful exertion of body or mind, all love of natural objects, all interest in things most largely influencing the happiness of mankind. All the higher pleasures of human beings have always been unknown to these patients. Minds so feeble, or so spoiled, are unfit for the ordinary emergencies of a checkered life. Every stronger shock quite discomposes them. These evils have generally taken deep root before the patient's manifest want of reasonable control induces a resort to an asylum; but a large portion of the moral treatment resorted to in asylums consists in the discouragement of the evil habits of mind into which such frivolous and unhappy beings have fallen. Exercise in the open air; customary and general activity; regular hours; a moderate attention to music and other accomplishments instead of an extravagant devotion of time to such excitements; protection from fanatical exhortations; and the substitution of sensible books for the worthless tracts and volumes with which their well-meaning friends have generally loaded their boxes, and which are thenceforth locked up as so much mental poison, contribute largely to the patient's advance towards rationality. The same kind of care might, in many cases, have preserved the mind from derangement; but the attention of parents and teachers is seldom directed to the important object of the prevention of insanity."[1]

[1] Treatment of the Insane, p. 160.

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These and many others that might be mentioned, are undoubtedly predisposing causes of insanity in women. "Are not the extreme susceptibility and sedentary life of women, their peculiarities even," asks Esquirol, "the predisposing cause of this malady? The numerous passions which among them are so active; religion, which is a veritable passion with many when love does not exclusively occupy their heart and mind, jealousy, fear, do not these act more energetically on the minds of women than men? As said Zimmerman, 'insanity comes often to girls from love, to women from jealousy, while from pride to men.' Moreover," continues Esquirol, "women yield to the causes of insanity proper to the sex; physical causes acting more frequently upon them than upon men. Are not women under the control of influences to which men are strangers; such as menstruation, pregnancy, confinement, and nursing?"[1]

That healthful though continued mental excitement may prevent the tedium vitæ which over-indulgence in the dissipations of society so often brings to women is no paradox, and we should, therefore, have no reason for wonder, if there had in reality been "a decrease of cases of insanity occurring in women since the present war commenced, from the various charitable and benevolent operations which have so largely excited their sympathies and received their support," although, upon the other hand, there would seem to have been at least a counterbalancing number of shocks from sudden bereavement and fright.

That the predisposing or proximate causes, whether moral, mental, or not, and the physical or ultimate causes rarely act alone, is no proof of the non-existence of either. They unite and become complicated in many cases where they produce insanity. A fright occasions the suppression of the menses, and this becomes the cause of mania, which ceases with the return of the menstrual evacuation. A woman during her confinement experiences a severe disappointment; the lochia are suppressed, and an eruption of mania takes place. We may with truth affirm that insanity in women rarely takes place without the concurrence of both physical and moral causes.[2]

It is well known that much of the insanity of women has been attributed, both in asylum reports and elsewhere, to previous general ill health, as owing in some instances to the effects of climate,

[1] Mental Maladies, p. 211.
[2] Ibid., p. 382.

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hard work, &c. &c. Upon this point I will subjoin a few remarks that have been communicated to me by my colleague Dr. Patterson, of the Iowa Asylum.

"It will be seen that among the assigned causes, 'ill health' of various kinds is most prominent. It will seem strange that among the rural population of Iowa, away from the excitements, temptations, excesses and poverty of large cities, alike remote from the malarious fevers of the South, and the pinching cold of the North, while quietly engaged in the peaceful pursuits of agriculture, any considerable number of our people should ever become insane. And yet such is the fact. Many of them, especially the wives and daughters of farmers, become insane. Probably three-fourths of the adult people of Iowa are connected with agricultural pursuits.

"*A vast majority of all cases of insanity arise from causes and circumstances which depress or exhaust the nervous power.* Grief, domestic unhappiness, disappointed affection, the puerperal state, perplexities in business, all tend to depress, and, if long continued, to exhaust the vital force, and are therefore prolific causes of insanity.

"The farmers of Iowa have not yet learned how to live comfortably. Their dwellings are badly constructed, often in low, damp, poorly drained locations, with either no ventilation, or too much. They are badly warmed by direct radiation of heated iron, so that the process of partial roasting and freezing is at once experienced by the same person. Their surroundings are too often unpropitious, their physical comforts and social enjoyments too much neglected. In inclement seasons, amid exposures to cold and rain, their bodies probably receive less care and protection than those of any other class. With abundant supplies at command, their diet is too limited in variety, often unskilfully prepared, and the whole science of gastronomy set at naught. The laboratory, in which are manufactured the life blood and the vital forces, is too often lumbered with ill-assorted, indigestible, badly-cooked food.

"The wives and daughters of farmers, during inclement seasons, have fewer comforts connected with out-of-doors life, and less adequate protection from cold and humid air, than the women who live in our towns and cities, and it is probable, taking prairie farm life, with all of its surroundings, as it exists in Iowa, that the average standard of the vital force in those who live upon farms, is below that of those who live in the towns and cities. It must not, however, be inferred from these suggestions that the noble and

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pleasing pursuits of agriculture favor the production of insanity. The errors of living, and the discomforts alluded to, are not necessarily connected with, and certainly not limited to farm life.

"Much of our insanity results from our ignorance or disregard of the laws of animal life. Much of it might be avoided by the exercise of proper care and good judgment in forming alliances, and in the care of our bodies, which are so 'fearfully and wonderfully made;' by ruling the passions and appetites; by lives of prudence; by moderating the extravagant expectations of this life; by using innocent recreations and the bounties of a kind Providence as not abusing them; by regular hours and favoring circumstances for refreshing sleep; by well-regulated households; by an abiding religious faith, and *by the avoidance of those indulgences and habits of life which favor a deterioration of the blood, depress and exhaust the nervous power, and break down the defences which Nature has set up for our protection.*"

There can be no doubt that influences, such as have been above described, do, in many instances, exert a powerful influence upon the nervous system in women, especially if accompanied by disturbance of the pelvic organs, which, indeed, they are so likely to occasion.

The point to which we have now so naturally been brought, the physical causes of insanity peculiar to women, and their preponderance and efficiency as compared with those of the male sex, is one that is allowed by many writers, but by most of them is either forgotten or practically contradicted in treatment. Thus Tuke, in his analysis of physical causes, in both male and female, upon a basis of many thousands of cases, places first intemperance, and next epilepsy and disorders more or less connected with the uterus, considering these last as equally productive of insanity, and far more frequently so than all other diseases, or vicious indulgences, or affections of the head and spine, whether idiopathic or traumatic.[1] A most important allowance has here been made, when it is recollected that of the causes above enumerated, a large proportion of the intemperance of women initiates in or is kept up by alcoholic stimulants, for the purpose of relieving functional or organic uterine disease; that a large proportion of the epilepsy in women is of uterine causation, and that a large proportion of the vicious indulgences of women, especially those of self-abuse, are dependent upon uterine or other local irritation, and so the effect of disease.

[1] Loc. cit., p. 258.

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I shall present another admission to the same effect from the same author, as it more than corroborates the conclusions to which we shall eventually be brought. "When we reflect," he remarks, "on the very large number of cases of insanity more or less connected with functional or organic disease of the uterus, and remember that among barbarous nations these disorders are unquestionably of less frequent occurrence than in civilized society, we shall not fail to recognize in this difference one reason why more mental disease might be looked for in the one condition than in the other. Parturition itself, according to the general testimony of travellers, interferes much less, and for a shorter period, with the healthy action of the body and mind among savage nations than among the luxurious daughters of artificial life."[1]

"There can be no doubt," says Bucknill, "that uterine disorders constitute one of the most frequent remote causes of insanity with which we are acquainted. If, therefore, the physician can ascertain that his patient has suffered, or is suffering from gastric, hepatic, intestinal, or uterine disease, he will have discovered a well-known and frequent cause, the existence of which must be allowed to exercise its due influence in the diagnosis."

"Disordered states of the abdominal viscera," he again remarks, "are of such frequent occurrence, that the veteran Jacobi and some other physicians of eminence, have believed that they altogether account for the causation of mental disease. We are far from being able to concur in this narrow view of the etiology of insanity; but no physician of much experience in this department of medical science will be likely to deny, that disordered states of the stomach, the intestines, and the liver, frequently constitute the remote causes of cerebral disease."[2] It will be remembered that many of the disordered states of the stomach, the intestines, and the liver in women are directly dependent upon uterine derangement, being either caused or kept up by this.

"The functions peculiar to the female sex," we are told by another writer, "and the natural sensitiveness of the nervous system in the latter, render them very liable to disturbance of the mind when those functions are irregularly performed. From the commencement of puberty to the approach of old age, this source of disordered nervous and mental action exists, and in every case of insanity occurring in females, the possibility of some bodily func-

[1] Loc. cit., p. 57.

[2] Ibid., p. 280.

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tional derangement existing simultaneously with, and perhaps operating as the exciting cause of, the mental affection, should never be forgotten. Amenorrhœa, dysmenorrhœa, menorrhagia, pregnancy, miscarriages, parturition, the puerperal state, lactation, the cessation of the menstrual function, are each occasionally productive of mental disorder, which can only be cured by attention to the exciting cause. This consequence of such ailments is naturally rendered much more probable when moral disturbing causes are also in action."[1]

The frequent coincidence of an uterine crisis or of uterine disease with insanity in women, must be allowed. It has been claimed, however, that this coincidence is one only of time and not of character, that there exists between them no relation of cause and effect. By no one has this assertion been made more succinctly or more emphatically than by the present veteran superintendent of the hospital at Northampton, and Professor of Psychological Medicine in Berkshire Medical College, Dr. Pliny Earle, whom I therefore quote.

"It is well known by persons who have much experience in insanity," says Dr. Earle, "that in females there is no constant relationship between the pathological mental condition and the mensual exudation. Some women become insane, continue so for months, and recover, without any interruption of the regularity of their monthly periods. In some the mental disorder precedes, while in others it follows the suppression of the menses. When these have been suppressed, either before or after the invasion of insanity, they may return without having any curative effect upon the mental disease. Some patients recover soon after the reappearance of them, others before their reappearance. When the menses continue regularly through the progress of insanity, in some cases there is an exacerbation of the physical and psychical excitement at the periods, but in others, and I believe it may be said the majority, no such exaltation occurs."[2]

The above statement, which was made only as part of an argument against the too frequent resort to bleeding at asylums, might be fully allowed, and yet in no way materially affect the truth of the theory, that upon the state of the uterine system often depends the cerebral or mental integrity of women. The occurrence or non-occurrence of the menses, their existence, deficiency or excess,

[1] Robinson: Physical Causes of Mental Disorders, p. 115.

[2] American Journal of Insanity, x. 398.

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are but a single one of the many important questions involving a reflex influence by the uterus or ovaries. But even here it will be seen that there is room in every case for much careful investigation, regarding the frequency of the discharge and its coincidence with the usual standard, as to time of appearance, its duration and the length of the interval; its abundance or deficiency; its consistence as to fluidity, and the presence or not of clots, and its odor; its bland or irritating character; its accompaniment or not by pain as a precedent, accompaniment, or consequent; its alternation, connection, or supplantation with or by a leucorrhœal discharge; all these are points without due attention to which all expressions of doubt or discredit are plainly unfounded. If it be, as I have suggested, that the depurative character of the catamenia as eliminating, alternately or in conjunction with the lungs, any excess of carbon from the system, is here efficiently in action, we cannot by a stroke of the pen destroy its influence upon the causation of insanity.

Allowing the coincidence of mental and uterine disturbance, and that the two are in some way connected, it may be asserted that the latter is the consequence of the former, rather than its cause. Thus Dr. Kellogg points out that the influence of strong mental emotion upon the menstrual secretion is very marked. There are few women of intelligence who have not noticed this fact, and this influence is particularly marked in any of the usual disorders of menstruation. Menorrhagia is almost invariably aggravated by powerful mental emotions. Some forms of dysmenorrhœa are not only caused, but rendered more painful, by mental or moral disturbance.[1] "Acute suppression of the menses may arise," says Churchill, "from a bodily or mental shock received either just previous to, or during menstruation;" and he gives, in a note, the following interesting illustration of this. "Almost all the women," says he, "who are sent up to the Richmond Penitentiary, after being tried at the Recorder's Court, labor under suppression of the menses, in consequence of the mental agitation and distress they have undergone."[2]

The frequent occurrence of this result, I am ready to freely allow, but it is no proof that the converse may not more frequently obtain. The twofold possibility of action and reaction is only additional evidence that the sympathy, which is so constantly to be observed between the womb and the stomach or the breasts,

[1] Am. Journal of Insanity, Apr. 1856, vol. xii. p. 315.
[2] Diseases of Women, p. 155.

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also exists, and to a marked degree, between the womb and the brain. This interchange of reflex effect, when admitted, tends to throw light upon the paradox that had puzzled Dr. Earle, who apparently could not understand how functional derangement or functional crisis could in one instance exist as effect, and in another as cause. The coincidence at the same time of moral influences, differing or identical, would tend still further to complicate the question, which is, however, usually easily enough solved by recollecting that more than one derangement or lesion may at one time be present in a single organ.

In will be noticed, moreover, as Dr. Brown-Séquard has claimed for the epileptic aura, when originating from an otherwise healthy womb,[1] that the irritation, though propagated from that organ, may result from an abnormal change in the quality of the blood within its vessels, or of its secretions other than periodical.

Upon these points, as they are all of great practical importance, I shall add a few words from Dr. Bucknill. It will be seen that in more than one connection, he clearly mistakes an effect for the cause, and the cause for its effect.

"There can be no doubt," he says, "that the sexual instinct is not unfrequently thrown into a state of extreme excitement, by pathological changes taking place in the nervous system. This painful form of disease not unfrequently presents itself during the semi-pathological changes of old age. Those who have been distinguished, during a long life, for prudence and propriety in their relations with the other sex, when, from old age, they have one foot in the grave, are sometimes seen to throw off all restraint, and to rush into the most reckless and disgusting libertinism. Whether or not this change of manners is accompanied by diseased processes in the brain, we have not yet been able to ascertain by observation. This, however, seems highly probable, since we have seen nymphomania end fatally in young women; and in these cases, in addition to false corpora lutea, we have found great cerebral congestion.[2] Excitement of the sexual functions may depend upon spinal irritation alone, the lascivious ideas being secondary results, just as ideas of food are the results and not the causes of

[1] Med. Times and Gazette, March, 1863.

[2] Dr. Bucknill forgets that the corpora lutea of menstruation, the cicatrices of ovulation without impregnation, are a normal occurrence, and that nymphomania, however extreme, may result from the pruritus reflexly produced by uterine disease, as for instance carcinoma.

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hunger. Nymphomania, as an example of monomania, is, therefore, liable to the objection that it may be a spinal or cerebro-spinal affection, and independent of that part of the brain, which is the organ of the mental [functions."]

The same author, in another connection, again refers to the matter just now under consideration, which is but one of the many and as yet but imperfectly discussed peculiarities I might mention of insane women.

"Every medical man," he says, "has observed the extraordinary amount of obscenity in thought and language, which breaks forth from the most modest and well-nurtured woman under the influence of puerperal mania; and although it may be courteous and politic to join in the wonder of those around, that such impurities could ever enter such a mind; and while he repudiates Pope's slander, that 'every woman is at heart a rake,' he will nevertheless acknowledge that religious and moral principles alone give strength to the female mind; and that, when these are weakened or removed by disease, the subterranean fires become active, and the crater gives forth smoke and flame."[2]

Esquirol tells us that women in a state of demonomania experience a thousand peculiar sensations. "They believe they are transported to the midnight assemblies of wizards, where they are witnesses of the strangest extravagances. They have intimate communications with the devil or his subordinates, after which, a collapse bringing an end to the attack, they find themselves again in the same place from whence they believed they had been taken. Who does not see in this the last stage of what, perhaps, commences with hysteria? Amidst the obscenities of these meetings, which we shall be cautious about describing, who does not recognize the turpitude of an imagination polluted by the vilest, most obscene, and disgusting debauchery? Who does not recognize a description of the most extravagant, shameful, and ribald dreams? The frequent ecstasies which take place in nervous affections partake of a sublime and contemplative character if, during its waking hours, the soul is elevated to the contemplation of noble and divine objects. They are erotic, if the mind and heart lull themselves in reveries of love. They are obscene, if, when awake, one indulges in lascivious thoughts, and if the uterus, irritated and excited, gives place to illusions which are regarded as diabolical practices."[3]

[1] Loc. cit., p. 321.
[2] Ibid., p. 273.
[3] Mental Maladies, p. 245.

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Some psychologists have attempted to develop the hints given above, by separating from hysteria what they have termed hystero-mania, this being described as "a true mania developed upon a state of hysteria."[1] In practice, however, it will be found very difficult to draw the border line.

The fact just before alluded to has not escaped the notice of observers outside of our own profession.

"It is not all persons," laments Archbishop Sharp, "that do complain of these wicked and blasphemous thoughts and other extravagant fancies, nor all good persons that are thus haunted, but chiefly those that are of a melancholy constitution, or those of the devout sex; women are more thus affected than the other sex. It concerns, therefore, all these persons to look after their bodies, for upon the cure and health of them the cure and health of the mind doth, in a manner, all in all depend."[2]

"It would be very surprising," very sensibly remarks Brierre de Boismont, "if with sensations different to those which are experienced by persons in health, the invalid should continue to reason the same as such persons do; it is true, indeed, that the reason would be perverted and strange."[3]

He elsewhere, in alluding to the fact that erotic hallucinations are far more common in women than in men, endeavors to explain this difference by the greater facility man possesses for gratifying his desires.[4] He should have added to this, that it is more especially owing to the greater and more constant predominance in women of the sexual system.

There is an old proverb that women advanced in life become either angels or devils. The change referred to is owing to the effect upon them of the conditions occurring at the grand climacteric, as effective for good or evil, alike as regards mental, moral, or physical health, as is the establishment of puberty.

Attempts at explanation of these phenomena have been made upon other grounds, but upon examination it is found that the difference is one of words rather than of ideas. Thus Bucknill would lay it down as a general rule that in pure dementia, the sexual instinct is greatly weakened or destroyed. "This will be found," he says, "to be the case even in instances where indecent

[1] American Journal of Insanity, Oct. 1860, p. 120.
[2] Casuistical Sermons, vol. iii., London, 1716.
[3] Work on Hallucinations, p. 367.
[4] Ibid., p. 313.

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conduct is observable, for such conduct would seem to arise, not from activity of the instinct, but from the loss of modesty, and from inability to appreciate the rules of decorum. In those cases of senile insanity which are attended by lascivious conduct, the form of mental disease more nearly approaches that of mania than that of dementia. There is a mixture of the two states, but the maniacal element preponderates."[1]

It would seem that there was here present a bias to erotic ideas, without their becoming efficient in act through exertion of the will, just as we frequently see in general practice, where from ovarian, uterine, vaginal, or vulval irritation, the most lascivious dreams and day-dreams may occur, being confessed to upon inquiry; and yet the patient, though restrained by no apparent check, evinces no symptoms of nymphomania, just as a patient may be homicidal without giving sign of what is passing in her mind, or may breathe threatenings and slaughter though in act perfectly harmless.

There has still another explanation been offered; only occasionally, however, possible of correct application. It is thus stated by Esquirol, who says that women of hysterical tendencies have sometimes seen the devil under the form of a handsome and well-made young man. Doubtless, libertines, abusing the weakness of such invalids, may thus have borrowed from the devil his form and power.[2]

But it is not women alone who are here in danger. The erotic fancies of the insane may well be looked for in some of the trials for bastardy, rape, and adultery that are brought before courts of law. These are no groundless fears. There are many erotic patients who are convinced that they have had intimate relations with men to whom they have scarcely ever addressed a word, but by whom their imagination has been fired. A case to the point is familiar to most psychologists. It is that of a lady who attended the botanical course of a celebrated French professor. After a few lectures she persuaded herself that she was pregnant by this gentleman, advanced though he was in life, and to whom she had never spoken. Nothing dissuaded her from the belief. The menses were suppressed. She became emaciated and lost her appetite. She spent the eighth month in preparing child-bed linen. The ninth and tenth months were passed without confinement. She thought that the reason of this was that there were no labor pains present, so

[1] Loc. cit., p. 291.

[2] Esquirol, loc. cit., p. 246.

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she stood for a long time upon her naked feet in order to provoke them. She thought that she heard the Professor exhorting her to patience, and encouraging her to support the throes favorable to parturition. In other respects she was perfectly rational.[1]

"While supposed intercourse with demons," says Brierre de Boismont, "is less common than formerly, the hallucinations generally assume the form of an angel, or of men gifted with all the charms which the imagination can bestow upon them. They frequently refer to the head of the Asylum."[2]

We have thus far been speaking, it is true, more particularly of a single class of cases of mental derangement, those attended with peculiar delusions, distressing to the last degree to all the friends of the patient. The remarks are equally applicable to many other forms of insanity, but here their special causation is often and clearly enough to be distinguished.

"Irritations, pains, and lesions of the organs of generation are," says Esquirol, "in some women, more particularly, the frequent cause of illusions. They have sometimes, indeed, caused the insane to mutilate themselves. Erotic female monomaniacs experience all the phenomena of an union of the sexes. They think themselves in the arms of a lover or ravisher. Cancers and ulcers of the uterus are not uncommon among them. The hysterical insane are disposed to attribute to enemies, to the jealous, and to the devil, the constriction of the throat which suffocates them. The flying pains which they experience in the limbs and viscera, give rise to the most painful illusions."[3] Contrary to my general intention, I will present from the same unexceptionable authority, a few cases of this character, plainly illustrating, as they do, the physical cause of the mental disturbance.

[1] Esquirol, loc. cit., p. 246.

[2] Hallucinations, p. 122. The last sentence of this quotation is not uninteresting in connection with some comments made by my colleague, Dr. Van Deusen, upon the communication made by myself to this Association at its last meeting. He says, in a letter dated June 28th ult., "I was not before aware of the risks and difficulties experienced in making the examinations referred to. I was not aware that any superintendent had been charged with any of the improprieties intimated; that there had been any legal examination, or anything of the kind, to suggest as a parallel the Beale case, or any occurrence in this country or elsewhere to call for the appointment of an advisory medical board, upon that ground." The quotations from the learned authorities whom I have cited, prove the possibility of the charge, and of its actual occurrence, and at least one case in this country has come to my own knowledge.

[3] Loc. cit., p. 115.

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A. D—— first menstruated at fourteen. The discharge was always scanty and irregular, and permanently ceased at thirty. She was disappointed in love at this time, and became melancholic. Subsequently there occurred the sensation of painful constriction of the throat, and she was constantly rolling up the skin of the neck with her fingers, and crowding it beneath the sternum. There was considerable tension of the abdomen, and this she attributed to the devil having extended a cord from the sternum to the pubes, and another around her neck, upon which he drew, endeavoring to strangle her.

In the notes of the autopsy it is merely mentioned that the abdominal viscera were found agglutinated by an old peritonitis; no examination of the pelvic viscera seeming to have been made.[1]

M——, aged forty-nine, was first unwell at fifteen. The menses ceased at forty. From this period she commenced to have headache, and gradually became insane. The abdomen was hard and voluminous, and the patient had constantly her hand upon it. She stated that she had in her uterus an evil spirit in the form of a serpent, which left her neither by day nor by night, and that her organs of generation were not like those of other women, although apparently normal.[2]

L—— was a laundress, and had always been very devout. The menses commenced at fifteen. She married at seventeen, and became the mother of fifteen children. At forty-six the menses became very irregular, but did not cease until fifty-two, her insanity commencing during this interval. She suffered constantly from uterine pains, and alleged that the devil had been her husband for a million years, and that he was the father of her children; that her body was a sack made of the devil's skin, and filled with serpents, toads, and other unclean creatures.[3]

A woman, who had been subject to dysmenorrhœa, became the mother of an illegitimate child. She afterwards experienced gastro-intestinal disturbances, and, as so often occurs, became a bigot. At the final cessation of the catamenia she became maniacal, and entered an asylum. She now believed that Pontius Pilate had been the father of her child, and that he had taken up permanent residence in her bowels, where also the popes held frequent council, being visited at times by the prophets and evangelists, and all the illustrious personages of the testaments.

[1] Esquirol, loc. cit., p. 239.
[2] Ibid., p. 240.
[3] Ibid., p. 242.

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At the autopsy, the pelvic viscera were found closely united by peritonitic adhesions, but were not properly examined.

Another patient, in whom the same lesion was discovered after death, believed that she had several devils in her belly who were constantly tempting her to destroy herself.

A female monomaniac, previously affected with hysteria, was convinced that serpents and other animals, and even the devil, introduced themselves into her body through the genital organs.

Another patient, in confinement at an asylum, imagined that she had in her bowels a regiment of soldiers, and that she could feel them fighting and struggling with each other. When the pains were exacerbated she became excited, crying out that the soldiers were giving blows to each other with their weapons, and at the same time were wounding her entrails.[1]

A woman insisted that she was pregnant by the devil. She died, and her womb was found distended by a mass of hydatids.[2]

H—— did not menstruate until twenty-four years of age, and since then had been subject to headache and colicky pains. At her third and last confinement, she had a difficult labor, which was followed by attacks of syncope. From this period she imagined that the devil had stolen her body, leaving only a phantom.[3]

"In many cases of monomania," says Ray, "the hallucination is excited and maintained by impressions propagated by diseased parts, the presence of which has been revealed by dissection after death."[4]

Such instances as these are not uncommon. I have myself seen several of them, but shall not narrate them at the present time, as I wish here to draw my data from superintendents themselves, whose authority and whose admissions cannot be gainsaid. A case almost identical with that last given, and clearly dependent upon uterine disease, was sent to the Somerville Asylum, by my direction, during the last year.

Instances of supposed pregnancy by the devil, or criminal intercourse with his majesty, are probably more common than was thought by Brierre de Boismont. A case has been referred to by many writers, where exorcism was successfully practised by St. Bernard. A precisely similar instance came into my own hands several years since, in which an equally beneficial result was produced with the aid of a priest. In certain instances, it would not

[1] Esquirol, loc. cit., p. 114.
[2] Ibid., p. 211.
[3] Ibid., p. 241.
[4] Medical Jurisprudence of Insanity, p. 159.

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be surprising if such delusions were entertained by superstitious minds, otherwise perfectly sound. I refer to the not uncommon cases of the so-called pseudo-cyesis or spurious pregnancy, to which attention has so forcibly been called by Simpson.[1] In this affection, as is well known, there are present many of the signs of pregnancy, enlargement of the abdomen and breasts, arrest of the menstrual function, sympathetic derangement of the stomach, and oftentimes a spasmodic and irregularly clonic contraction of the recti and other muscles of the abdomen, closely resembling in their effect the movements of a fœtus in utero. It is sometimes as difficult in these instances to persuade the patient herself that she is not pregnant, as it is her friends; and if she is conscious of never having had intercourse with man, she readily imagines that it has been an immaculate or otherwise supernatural conception.

But I must defer to another occasion, my comments upon this and similar points in utero-mental pathology, though the explanations that I would offer are, I believe, in their application original and of very practical importance.

There are one or two matters, however, of such medico-legal bearing that I should do wrong to omit them. Believing as I do that obstetric jurisprudence has been one of the most neglected, as it is one of the most important, of the branches of State medicine, I desire by the investigation of these questions relating to insanity in women, to contribute somewhat to its advance, as I have previously endeavored to do in my treatise upon criminal abortion.[2]

The first point to which I shall allude may seem a trivial one. It is that of a morbid and extreme fondness for pets, among women living solitary or secluded lives, and is most commonly brought out in courts during the decision of civil cases. In one suit for instance that is on record, it was charged that the testatrix was insane, because she kept fourteen dogs of both sexes, with their kennels, in her drawing-room; two of them slept in her chamber, and one of them, which was blind, in the same bed with her;[3] another lady kept her sitting-room filled with monkeys, to the great annoyance of her visitors; others have not been happy unless surrounded by parrots, or their room converted into aviaries for all kinds of birds. In one celebrated case, that of Mrs. Cummings, there was exhibited

[1] Obstetric Works, Scotch Ed., vol. i. p. 300; Clinical Lectures on Diseases of Women, p. 276.

[2] Criminal Abortion in America. Philadelphia: Lippincott & Co. 1860.

[3] Yglesias *v.* Dyke, Prerog. Court, 1852.

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a propensity for cats, which were provided with their meals at table at regular hours and were furnished with napkins.[1]

"This propensity for animals proves nothing in relation to the existence of insanity," says Taylor, "unless there is good evidence of mental aberration." On the other hand, it has often been illustrative of decided monomania, and I believe is generally dependent upon ovarian or uterine irritation.

Within a few years, a class of cases has made its appearance, exceedingly embarrassing to the medical jurist. These cases are not uncommon. Their description I shall now submit, from Dr. Ray. "The woman, after preparing for an union to which her head and heart had apparently fully consented, and going through the marriage ceremony with the utmost propriety, manifesting all the while nothing unusual in her deportment, immediately after imbibes an insuperable aversion towards her husband, shuns his company, and perhaps refuses to live with him. In some of the cases, other singularities of conduct soon appear, one after another, till at last the woman becomes a subject of unequivocal insanity. In others, however, this strong repugnance towards the husband continues to be the principal, if not the only, symptom of mental disorder; but so closely do they resemble the former in other respects, that we can have no hesitation in regarding them as merely varieties of the same affection. The pathological character of these cases seems to be sufficiently obvious. From some cause or other, the patient has been affected with a cerebral irritation not sufficient to disturb the mental manifestations, and which under favorable circumstances might have entirely disappeared. In this condition, marriage, with the crowd of new thoughts and feelings by which it is preceded, operates as a powerfully exciting cause, and under its influence the pathological affection is completely developed. It is not strange, certainly, that marriage should occasionally find a female brain in this morbid condition; nor that, in case of such a conjunction, the result here mentioned should follow. The legal relations of these cases are not so satisfactorily settled. In some of them, a close scrutiny of the conduct and condition previous to marriage, may detect indubitable signs of insanity; while in others no such signs can be discovered, though subsequently the mental disorder may have become no less obvious.

[1] Taylor, Medical Jurisprudence, p. 658. See also Dryden *v.* Fryer, Q. B., Dec. 1850; Journal of Psychological Medicine, 1851, p. 285.

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Now are we prepared to make a distinction between them? To grant divorce in one class and refuse it in the other? This, no doubt, would be highly convenient, but we are not sure that it would be strictly just. While we see not how legal relief can be withheld in the former class, yet in regard to the latter, we recoil from the idea of depriving a woman of her protection and support, at the very moment when the severest of earthly calamities has overtaken her, merely on the strength of what we may call a pathological abstraction."[1]

To the explanation above given by Dr. Ray, I will add two others, which seem to have escaped his notice. In some of these cases the woman gets her first intimation, at or soon after the time of marriage, that her husband has previously had to do with others of her sex, and, as in more than one instance that has come to my knowledge, she shows her disappointment and her disgust accordingly. In other cases, as is well known, the conjugal approach is attended with excessive pain. This effect, normal with the first coitus, at times becomes persistent and a veritable disease; exhibiting itself either in the hyperæsthesia of the vulva which has been termed vaginismus by Dr. Marion Sims, or in an extreme sensibility to touch on the part of the uterus itself. Of both these affections I have now cases under treatment; in one of the former the husband had applied for divorce on the ground that his wife is an hermaphrodite, whereas she is in reality perfectly formed. In one of the latter, the patient having been sent to me by Dr. Walker of the City Lunatic Hospital at South Boston, on the ground that insanity was threatened, the husband had been driven to adultery by the practical uselessness, for marital purposes, of his wife.

I have spoken of obscenity and lascivious conduct in women, as the result of disease. There is no doubt that the same explanation is applicable to a large proportion of the cases of so-called self-abuse, which are not uncommon, and are frequently carried to an insane extreme; though insanity, as its consequence, is less frequently occasioned than in men, from the absence of a corresponding exhaustive discharge. So far from being considered and treated as a vice, or from being considered and treated only by moral means, these cases should very frequently be conducted as any others of physical disease. The irritation of ascarides, hæmorrhoids, or mere

[1] Medical Jurisprudence of Insanity, p. 240.

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constipation, of morbid states of the catamenia, of the urine, or of the vaginal secretions, or lesions of the organs themselves, may each and all of them rest at the foundation of the habit, as efficient causes without whose removal no cure can be hoped for or obtained.

There are other cases, to a still greater degree involving the mental integrity and the moral responsibility of women. Cases of intemperance, habitual or periodical, of mendacity, of theft, of jealousy, of homicide. Had I not already trespassed so largely upon the patience of the Association, I would present at this time the valuable material I have in my possession relating to what I consider should be the true legal responsibilities of women, their extent, and whether they should be confined either as regards their character, or the time of their occurrence, to any particular periods or epochs of her life. This subject has not escaped the observation of Michelet,[1] and in reference to its relations with pregnancy has attracted the attention of Sedgwick[2] and others.[3] I believe not only that the execution of pregnant women should be stayed for the sake of the life of the child, examination by a jury of matrons, instead of by skilled medical men, being a farce, whose occurrence at the present day is alike a disgrace to the law and to civilization; but that no pregnant or parturient woman, for a crime committed during her gestation, or shortly after her confinement, should ever be executed at all.

A few words upon this point, based upon sound analogy, I shall extract from the work of a well-known and well-educated veterinary surgeon, and shall incidentally refer to the subject again in the course of this report. "Some bitches," says Mayhew, "cannot be induced to suckle the pups they have given birth to, and others, though less frequently, will eat their progeny. The disposition to desert or destroy their young seems to prevail among the parentage of this world. In the female of the dog the maternal instinct is most powerful; but under certain conditions of the animal's body, the natural impulse seems to be perverted, and she takes the life she would else have perished to preserve. It is painful, knowing this, to reflect that on his own species man inflicts the highest punishment for an act that possibly may be, in the human being as in brutes, the consequence of a mental excitement accompanying the period of parturition. Women not in distress and otherwise

[1] L'Amour, p. 334.

[2] Medical Critic and Psychological Journal, October, 1863, p. 604.

[3] American Journal of Insanity, January, 1856, p. 295.

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afflicted, rarely indeed are guilty of infanticide; and I have observed annoyance or ill health precede or accompany the like act in animals. If the rabbit be looked at, her alarm seems to change her nature; and the bitch that devours her pups will, upon inquiry, be generally found to have suffered some species of persecution. That the brain is affected there can be no doubt. The unnatural propensity is itself a proof; but the strange appearance and altered looks of the creature sufficiently denote her state. She is not then savage, her ferocity has been gratified, and she seems rather to be afflicted with a remembrance of the act she was unable to resist. She is the picture of shame; she shrinks away at our approach, and her eye no longer confidently seeks that of her master; her aspect is dejected, but I think more with sorrow than with crime. I would not plead for sin; but what I have beheld in dogs induces me to think that the majority of those who have been hung for infanticide were legally murdered. There is danger in admitting such an opinion; but seeing all animals at certain periods exhibit a certain propensity, it is very doubtful whether the morbid feeling as exemplified in the human race, is really one that calls for mortal punishment."[1]

Jörg, of Leipsic, who erred in his estimate of the legal and real value of the human fœtus, as I have elsewhere shown,[2] has expressed a very sensible opinion upon the responsibility of women during pregnancy and parturition, believing that pregnancy can so disturb the intellectual faculties that the patient becomes unable to control her propensities.[3] Montgomery, on the other hand, one of the most profound and most classical writers of modern medicine, believes that "this doctrine is as abhorrent from truth and nature, as it is calculated to lead to the most serious consequences,"[4] thus indorsing the views of Capuron and Devergie, who considered that such an opinion as I have described "would, by taking away all moral responsibility, be fraught with most disastrous results to society;"[5] although, as I shall now show, the Irish physician, like many another close observer who does not dare to follow his own data to their legitimate conclusions, most emphatically contradicts himself.

[1] Dogs; their Management, p. 217.
[2] Criminal Abortion in America, p. 58.
[3] Die Zurechnungsfähigkeit der Schwangern und Gebarenden.
[4] Signs and Symptoms of Pregnancy, p. 39.
[5] Médecine Legale, i. p. 433.

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VII.—RATIONALE OF PELVIC CAUSATION OF INSANITY.

As throwing some light upon the theory of the causation of insanity in women by reflex uterine action, or what Forbes Winslow has called the dynamical sympathies of the reproductive organs,[1] it may not be amiss if I present a few remarks concerning the nervous derangements of pregnancy, from the author I have just quoted, my friend, the late Dr. Montgomery of Dublin. I have selected the period of pregnancy rather than the puerperal state, concerning the mental disturbances of which we have had so much light from the pens of Dr. Gooch, and more recently Drs. Gundry of the Dayton Asylum, and Simpson of Edinburgh; because pregnancy, in itself considered, is rather a normal and physiological, than a pathological condition, its mental abnormal manifestations being of almost identical character with those attending the catamenial crises and climacteric epochs, not more frequently evinced than at these times, nor more decidedly, if indeed they are not softened down and palliated by the influence of gestation, as sometimes seems to be the case. Whether this, however, or the converse be true, there can be no doubt that the manifestations to which I would refer are clearly and undoubtedly of sexual origin.

"When speaking of the physical changes which the uterine system undergoes in consequence of impregnation, it was remarked," says Montgomery, "that the nerves distributed to the organ and its appendages were augmented in size and number, and, having their sensibility exalted,[2] diffused throughout the system generally an increase of nervous irritability, which, affecting both mind and body, displays itself under a great variety of forms and circumstances, rendering the female much more excitable and more easily affected by external agencies; especially those which suddenly produce strong mental or moral emotions, whether of the exhilarating or depressing kind, as fear, joy, sorrow, anger. The powerful influence of such impressions over the functions and actions of the uterus, in every stage of female life after puberty, is recognized in a multiplicity of circumstances, whether as deranging menstruation, inducing abortion, modifying the energy of partu-

[1] Journal of Psychological Medicine, April, 1854, p. 174.

[2] It is not necessary to suppose the uterine nerves augmented either in size or in number, to account for an exaltation of their sensibility.—H. R. S.

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rient action, or affecting the recovery from child-bed.[1] Hence the importance of preventing, as far as possible, pregnant women from being exposed to causes likely to distress or otherwise strongly impress their minds. Sights of an affecting kind, books, pictures, or theatrical representations which may deeply excite the imagination, or engage the feelings, are decidedly unsafe, and, in illustration of the dangers which may thence arise, I shall mention one or two instances. I was once urgently called to see a lady who had gone to the theatre, when two months pregnant, to witness some grand spectacle, in which armed knights on horseback were to cross a bridge and storm a castle; while doing so, the bridge gave way, and the besiegers were precipitated into the torrent beneath, and some of them much hurt. The lady was dreadfully terrified, screamed, fainted, and was carried home almost insensible, when it was discovered that she was flooding profusely; under the influence of which, and the previous fright, she soon became alarmingly exhausted. However, by the adoption of proper measures, she was restored and tranquillized; but she miscarried before morning. Another case was that of a lady, who, after passing several years of her life in straitened circumstances, and actively employed, married when no longer very young, and was thereby placed in a position of comparative affluence, which, unfortunately for herself, enabled her to dispense with any further exertion, and to indulge a natural inclination to indolence and sedentary habits. She soon became pregnant, and spent her whole time lying on a sofa at the fire-side, or with her feet on the fender, reading novels, eating and drinking heartily, and having a discharge from the bowels perhaps once or twice in the week. Amongst the books which she thus daily devoured, was one containing a highly-wrought description of one of the Maisons de Santé in France, and of its inmates; this affected her strongly, and took great hold on her mind, and she expressed the greatest desire to visit one of the large lunatic asylums in this city, that she might assure herself of the reality of such things as she had been reading of. In this wish she was indulged, as in everything else, whether right or wrong, to which she took a fancy; and the consequence was, that the appearance of the persons she had seen, and their extravagant expressions and gesticulations, continued to haunt her

[1] Burrows: Commentaries on Insanity, p. 378; Merriman: Synopsis, etc., pp. 33, 224.

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imagination incessantly up to the time of her delivery; on the third day after which she showed symptoms of insanity, which became rapidly confirmed, and continued for many months. During her illness, and after her recovery, she repeatedly told me that from the time of reading the book and visiting the asylum, she felt as if she would certainly become deranged.[1]

"The irritation of the nervous system is in some most obviously perceived in the change induced in the moral temperament,[2] rendering the individual depressed and despondent, or, perhaps, she who was naturally placid and sweet-tempered, becomes peevish, irritable, and capricious to a degree as distressing to herself as it is disagreeable to others; yet over this she has little control, and, therefore, much allowance must be made for such waywardness, which, instead of exciting opposition, resentment, or reproach, should claim our utmost indulgence and commiseration, and our best endeavors to comfort, soothe, and cheer. A lady of rank and very superior acquirements told me," he continues, "that, for the first two or three months of her pregnancies, she became so irritable that, to use her own words, she was a perfect nuisance in her house, and was so painfully conscious of it herself, that she would sometimes remain in bed all day, or confine herself to her room, to avoid displaying her irritability to the annoyance of others. This lady has since died of cancer uteri, under most deplorable circumstances.

"I have known the effect produced to be the reverse of this, and a decided amelioration take place in the temper, as we sometimes also see happen in the exercise of the bodily functions during pregnancy. A gentleman once informed me that, being afflicted with a stepmother naturally more disposed to practise the fortiter in re than to adopt the suaviter in modo, he and all the household had learned, from experience, to hail with joyful anticipations the lady's pregnancy as a period when clouds and storm were immediately exchanged for sunshine and quietness.

"Some suffer most from this irritability depriving them of sleep, night after night, especially if they have not guarded against feverishness by proper attention to the state of the bowels, or sleep in rooms too warm or insufficiently ventilated; and yet it is singular how little they appear to suffer from this loss of rest, seeming really as much recruited by the short snatches of sleep which they

[1] Signs and Symptoms of Pregnancy, p. 17.

[2] Harvey, 4to. edition, p. 593.

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obtain as they would, at other times, when enjoying unbroken repose. Others sleep, but suffer even more from painful and distressing dreams; while some are liable to annoyance of a totally different kind, being constantly so drowsy, that it is with difficulty they can keep awake, even in company.

"I suppose many have noticed a curious fact connected with the state of mind in pregnant women, when their bodily health is at the same time good, namely, that however depressed or dispirited with gloomy forebodings they may have felt in the early part of their pregnancy, they, in general, gradually resume their natural cheerfulness as gestation advances, and, a short time before labor actually commences, often feel their spirits rise and their bodily activity increase to a degree that they had not enjoyed for months before. I have known instances in which this took place so regularly and distinctly, in successive pregnancies, that the patients were able, from its occurrence, to anticipate and announce the near approach of their labor. This must strike us as a wise and beautiful arrangement by which, on the eve of suffering, the mind rises with a spring to meet the trial with cheerfulness and fortitude, which experience proves so materially to contribute to a happy result.

"Occasionally, however, the depression assumes a more serious aspect, and the woman is constantly under the influence of a settled and gloomy anticipation of evil, sometimes accompanied with that sort of apathetic indifference which makes her careless of every object that ought naturally to awaken an interest in her feelings; a state which we sometimes observe in fever and other severe disorders, in which it is justly considered a most unfavorable symptom. When this occurs in pregnancy, it will generally be found accompanied by very evident derangements in bodily health; a dull heaviness, or aching of the head, a loaded tongue with bitter taste in the mouth, constant nausea, costiveness, and a foul state of the alvine discharges, with not unfrequently a bilious tinge in the skin, and other symptoms indicating hepatic derangement, together with a quick pulse and a dry, hot skin, constitute the group of symptoms likely to be present, and which urgently demand attention for their removal before the time of labor, otherwise serious consequences are to be apprehended. Sometimes this state appears to depend on some peculiar condition of the brain, the nature of which we probably cannot appreciate, and which our treatment will but too often fail to correct; in one strongly-marked instance of this kind, which was some time ago under my care, the lady

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became maniacal on the fifth day after delivery, and continued deranged for many months."

Reasoning by analogy from such considerations as those we have just been engaged in, we should be led to expect as probable, what experience confirms as certain, that occasionally the cerebral disturbance during pregnancy, which, in most instances, only shows itself in unevenness of spirits, or irritability of manner or temper, amounts in some to absolute disorder in the intellectual faculties, especially in habits naturally very excitable, or where there is an hereditary predisposition. "If we consider," says Dr. Pritchard, "the frequent changes or disturbances occurring in the balance of the circulation from the varying and quickly succeeding processes which are carried on in the system during and soon after the periods of pregnancy and childbirth, we shall be at no loss to discover circumstances under which a susceptible constitution is likely to suffer. The conversions, or successive changes in the temporary local determinations of blood, which the constitution under such circumstances sustains and requires, appear sufficiently to account for the morbid susceptibility of the brain."[1] "One cannot deny," says Roussel, "that the minds of pregnant women are singularly modified;"[2] and this susceptibility to mental disturbance, on the part of the mother, has been recognized on high authority as giving rise to one species of congenital predisposition to insanity in the offspring. In some, this sensorial agitation may be confined to the more strongly marked forms of hysteria, or only exhibit itself in those unaccountable phantasies called longings, "which," says Dr. Burrows, "are decided perversions or aberrations of the judgment, though perhaps the simplest modifications of intellectual derangement,"[3] but others are truly, and even violently, maniacal. "I have on one occasion," says Montgomery, "noticed a case where mania occurred in eight successive pregnancies, and another in which the woman was three times similarly affected soon after conception, and remained deranged until within a short time of her labor, when she became sane, and continued so until the recurrence of pregnancy."[4] "Some," again remarks the author last quoted, "are insane in every pregnancy or lying-in, others, only occasionally."[5] Marc, writing on

[1] Treatise on Insanity, p. 312.
[2] Système de la Femme, p. 160.
[3] Commentaries on Insanity, p. 147.
[4] Dublin Medical Journal, v. p. 52.
[5] Loc. cit., pp. 364–378.

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the same subject, says, "I recall a patient in Esquirol's Asylum, in whose case the commencement of each pregnancy was characterized by an attack of transient insanity."[1] Goubelly relates a case of an opposite kind, in which the lady was of sound mind only during her pregnancies, but was then deficient in memory; of which latter defect the following is a remarkable instance.

"A fright produced by the dangerous situation of her only son when eighteen months old, brought on, in Mrs. Durant, an alarming illness, attended with some singular phenomena, the most singular of which respected her memory. The illness happened in July, when she was advanced six months in a state of pregnancy, and was, when perfectly insensible, delivered of a child. On awaking from her insensibility, which had continued for three days, she imagined it was the month of January. Her mental powers generally were but slightly impaired, and soon regained their former perfection; nor was her memory affected, except as regarded the preceding six months. Of that time she had forgotten all the events: some accidental circumstance might afterwards occasionally produce a train of thought, which would bring an event of those six months to her recollection; but several of the most important were never regained, nor could she to the hour of her death, remember that she had then been pregnant. I have met with a few instances in which the memory was similarly effaced, and under apparently similar circumstances, but for much shorter periods of time."[2]

It has been asserted that manifestations such as those we have now seen described, whether occurring in pregnancy, at or after child-bed, or during any other time of a woman's life, are merely attacks of hysteria, as distinguished from actual insanity, more or less aggravated as these may be. The error of such a supposition has been allowed by more than one psychologist. I have already called attention to the similar error of endeavoring to separate in all cases from hysteria the so-called hystero-mania. In some cases, however, of hysteria, the mania may be counterfeited.

"The diagnosis between exaggerated hysteria and incomplete primary mania," says Dr. Bucknill, "must be made by observing the sex, age, constitution, and character of the patient, which, to the experienced physician will generally reveal the nature of hysterical

[1] Dict. de Sc. Méd., xix. p. 489.

[2] Montgomery, Signs and Symptoms of Pregnancy, pp. 32–37.

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attacks, whatever form they may assume. They do sometimes assume the form of mania with violent general excitement and strongly pronounced moral perversions. These may be looked upon as the proper symptoms of the disease; but hysterical patients have been known to feign delusions and hallucinations, just as they will feign everything else. The hysterical type of the patient, the paroxysmal nature of the excitement, and the contradictions in which she may be detected when closely examined upon the circumstances of her supposed delusions, will rarely fail to detect the comparatively harmless nature of the affection. This will be the more easy, if the effect of remedies appropriate to hysteria can be tried. But hysteria does sometimes pass into real mania, and carry with it some of its own peculiarities. In all the instances in which we have observed this transition, there has been a strong hereditary tendency to insanity. The transition has been marked by an obvious febrile crisis, and by that most important symptom of early mania, loss of sleep. The medical man must, therefore, exercise due caution, in avoiding to pronounce any case to be purely hysterical because it has once been so. If, in a young woman of hysterical temperament, the perverted sentiments and desires, the strange conduct and excited demeanor pass into a febrile stage, accompanied by a rapid pulse, by loss of sleep, and by delusion or hallucination, hysteria has passed into mania. Patients are even met with, in whom periods of hysterical and maniacal excitement alternate; and it is not difficult to distinguish in them the period when the superficial disorder presents itself, and when it yields to the more profound and serious disease."[1]

With respect to hysteria, we are told by Dr. Montgomery, although in its ordinary or slighter forms, it is not perhaps properly deserving the name of mental disturbance, its more aggravated conditions are so closely allied thereto, that it must be extremely difficult to draw the line of distinction. "Cases of this kind," says Dr. Conolly, "approach near to insanity; and, indeed, a mind subject to the violent agitations incidental to the hysteric constitution cannot be considered as perfectly sane;"[2] a state of which Sydenham has given so admirable and graphic a description, in which he says, the patients "observe no mean in anything, and are constant only to inconstancy; so unsettled is their mind that they never are at rest."[3] "Of one fact, at least," says Montgomery,

[1] Manual of Psychological Medicine, p. 301.
[2] Cyclopædia of Practical Medicine, ii. p. 563.
[3] Swan's Translation, ed. 1769, p. 414.

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"my own experience and that of others afford sufficient evidence, that when the aggravated form of hysteria prevails throughout pregnancy, puerperal mania is much to be apprehended."[1]

"I have also observed, in not a few instances," he continues, "that women who, at other times, have been the subjects of that slight form of mental unsteadiness which goes by the name of extreme nervousness, and is evinced in an unreasonable susceptibility of impressions from slight causes affecting their moral feelings, but without any perceptible lesion of the intellectual faculties, and constituting probably the simplest form of moral insanity, have had their state of mind greatly improved during pregnancy; but soon after the termination of that condition, have exhibited, for a time, a greater degree of mental disquiet than was habitual with them, which, however, again settled down into their ordinary state.

"I desire now to observe that, in thus noticing some of the more remarkable phenomena occasionally displayed during pregnancy, it is not intended to imply that such are the usual concomitants of that condition; on the contrary, most of them are to be considered as rare occurrences, some of them remarkably so, and all as exceptions to the general rule; but, for this very reason, deserving of particular notice, as probably connected with a morbid state of the system, either absolutely existing at the time, though perhaps not otherwise clearly appreciable, or about to be developed, as in the case I have already related, where memory of the whole time of pregnancy was a complete void; my object being to point out forcibly, what experience seems to have fully established, that during pregnancy the system is in a state of unusual susceptibility; the activity of both the nervous and circulating systems being at that time greatly exalted, by which the female is rendered much more liable to be injuriously affected, even by ordinary causes, and still more so by any of a more impressive kind."[2]

The peculiar manifestations which demonstrate this exaltation of the nervous system are of the most varied character. They are familiar to every obstetrician, and to many of them attention has been called by Montgomery. Some women, for instance, are much troubled with frightful dreams whenever they are pregnant. Dr. Lowder used to relate the case of a lady who was obliged to have a nurse sitting at her bedside all night, to watch her countenance while she slept, and to awaken her as soon as she perceived her

[1] Burrows, loc. cit., p. 378.
[2] Signs of Pregnancy, p. 41.

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exhibiting distress under the influence of her dreamy terrors. Disorder of the alimentary canal, disturbing the already irritated nervous system, is, probably, the most frequent cause of this affection; it may also be induced by irregular or undue circulation of blood in the brain; relief has been obtained by acting upon such a presumption, administering aperients, and abstracting blood by cupping on the nape of the neck.

According to Beccaria, there is a peculiar kind of headache accompanying pregnancy, which he describes as an acute pulsating pain in the occipital region;[1] occupying particularly the part in which Gall places the organ of the instinct of reproduction. "This pain," he says, "is accompanied with giddiness on the least motion of the head, and with difficulty in supporting the light; it comes on suddenly, and, continuing for some time, is succeeded by an inclination to sleep."[2] It is often perceived.

There is another variety of headache, familiar to all who are conversant with the symptoms of sick women, as almost pathognomonic of uterine disease. It is generally attended with a peculiar and almost indescribable sensation of outward pressure at the vertex, and was excellently described, some years since, by Dr. Tyler, the present Superintendent of the McLean Asylum.[3]

Strange appetites, moreover, or longings, as they are called, and antipathies, are well known as frequent attendants on pregnancy in many persons; some of whom will long to eat unusual, and even revolting articles, while others, immediately after conception, are seized with an unconquerable aversion to species of food which were previously particularly agreeable to them. "I have seen," says Montgomery, "several well-marked instances of this, and, in particular, one in the case of a lady who assured me that she always knew when she was with child, by feeling a violent antipathy for wine[4] and tea, which, at other times, she took with pleasure. I had an opportunity of observing the accuracy of this indication, in the successive pregnancies of the lady alluded to. A patient of Dr. Dewees used to consume enormous quantities of chalk, when pregnant; and Capuron knew a woman whose princi-

[1] Annali Universal. de Med., Sept. 1830; Archives Générales de Médecine, xxiv. p. 443.

[2] Montgomery, p. 284.

[3] New Hampshire Journal of Medicine.

[4] This particular aversion was expressly noticed by Hippocrates as a sign of pregnancy, "vinum odio habent." De Infecundis, Cap. 6.

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pal food was long pepper, which she used to swallow by handsful;[1] under the same circumstances, one patient of mine eats quantities of cloves, for the first three or four months; and another indulges with equal freedom in eating dry oatmeal.

"There is a curious and interesting coincidence between such facts as these, and others not unfrequently observed in certain states of uterine disturbance, connected with suppressed or deranged menstruation; especially about the time when that function is first established, when it is not unusual to find girls eat with avidity the most uninviting substances, such as cinders, dry mortar, or clay; and in a case, about which I was some time ago consulted, the young lady used to pick the bog-wood out of the grate and eat it.

"This morbid state of the appetite did not escape the notice of Ben Jonson, who thus alludes to it:—

> 'She can cranch
> A sack of small coal, eat you lime and hair,
> Soap, ashes, loam, and has a dainty spice
> Of the green sickness.'[2]

"Such caprices of appetite may, at first, perhaps, only excite a smile, but experience appears to have sufficiently shown that their indulgence cannot always be permitted without imminent risk of injury to the mother, or child, or both."[3]

These propensities, in their essence maniacal and in their demonstrations often clearly so, have received special attention from another British observer,[4] to whom, however, I should hardly refer at this time had not his explanations of the phenomena in question been evidently accepted as valid by a noted psychologist, Dr. Forbes Winslow, from whose interesting though somewhat poetical article upon woman in her psychological relations, I shall accordingly present a few extracts.

"The modifications of the appetite, says Dr. Laycock, necessary in the female of the lower animals, for the proper nutrition and development of the ovum or fœtus, are occasionally reproduced in the pregnant human female as morbid appetites.

"It has been observed by naturalists that birds will eat lime or chalk while laying—obviously that the shell may be duly formed

[1] Traité des Accouchemens, p. 42.
[2] The Magnetic Lady, Act. I., Scene 1.
[3] Montgomery, pp. 278, 279.
[4] Laycock: Treatise on the Nervous Diseases of Women.

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for, if hens be deprived of the opportunity of obtaining it, the eggs have only a membranous covering, or an imperfect shell. So, also, female carnivorous animals have the appetite for their natural food more ravenously excited during utero-gestation and lactation, to the same end: namely, that of duly perfecting the nutrition of the young animal. These morbidly excited appetites are known as 'longings' in the pregnant woman, and in the young unmarried woman, as pica and bulimia. This change in the appetites has always attracted popular attention, and given rise to much astonishment, but we are now enabled to trace them to their origin. Dr. Laycock observes, that although during pregnancy some good wives 'long' for handsome dresses, furniture, &c., yet these longings are spurious, since the morbid feelings belong exclusively to the appetite for food. Ben Jonson notices these spurious longings, as follows:—

"'*Littlewit.*—O yes, Win: you may long to see as well as to taste, Win: as did the 'pothecary's wife, Win, that longed to see the anatomy, Win. Or the lady, Win, that desired to spit in the great lawyer's mouth, after an eloquent pleading.'—*Bartholomew Fair*, Act. III., Sc. 1.

"Ben Jonson, indeed, seems to have had some experience of this form of morbid appetite, for he refers to it again and again in his plays. Thus, in Act 1st, of that just quoted, he makes the same character say: 'Win, long to eat of a pig, in the fair, do you see, in the heart of the fair, not at Pye-corner. Your mother will do anything, sweet Win, to satisfy your longing, you know; pray thee, long presently, and be sick o' the sudden, good Win,' &c.

"The things desired in this ovarian perversion of the appetite are sometimes very extraordinary, and outrageously absurd. Dr. Laycock quotes Dr. Elliotson as mentioning in his lectures that a patient has longed for raw flesh (the carnivorous appetite), and even for live flesh, so that some have eaten live kittens and rats. Langius, a German writer, tells a story of a woman who lived near Cologne, who had such a cannibalish longing for the flesh of her husband, that she killed him, ate as much of him as she could while fresh, and pickled the remainder. Another longed for a bite out of a baker's arm. More marvellous masticators, than the case described in the play of 'The Magnetic Lady,' from which we have already quoted; although Dr. Laycock quotes the case of a German woman who would eat a bonbonnière of charcoal.

"The 'dainty spice of the green-sickness' is known by some

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pathologists under the term of 'Temper Disease.' It is attended by the impaired digestion and defective assimilation which characterize chlorosis, and by the most extraordinary perversions of temper, very frequently with regard to diet, the patient persisting in a system of starvation, or only taking the most improper food, or that which she can get by stealth. Here, again, we trace a link of the mysterious chain which connects organism together, and can have little doubt that this form of psychological change is due to a morbid action of the reproductive organs, such as occurs occasionally in pregnancy.

"There are other alterations in the mental character of women belonging to this class of perverted instincts, which are of greater importance, because they involve the social and moral relations. The hysterical cunning of the young female is traced by Dr. Laycock to the same ovarian source. Referring to the development of certain instincts in the female at the period of procreation, and when the care of offspring is the great end of life, he compares the artfulness of the lower animals with this hysterical cunning, and attributes it to the influence of the ovaria on the nervous system.[1]

"He also observes," continues the reviewer, "that astuteness is as much the characteristic of woman as courage is of man, but that these characteristics are not morbidly developed except under given circumstances. It is not until puberty that these peculiar qualities of the constitution of woman are distinctly brought out; and in brutes it is only when the business of reproduction is carried on, that this artfulness is so exalted as to rival the highest attempts of human sagacity. The skill they display in the choice of a secret place in which to deposit their eggs or young, and the finesse with which the latter are protected from discovery or injury, are well known to the most inexperienced student of natural history. The lioness, for example, ferocious and powerful as she is, when she fears the retreat in which she has placed her cubs will be discovered, will hide her footmarks, by retracing the ground, or brushing them out with her tail. When the young female suffers from irregular action of the ovaria on the system, the natural astuteness and quickness of perception degenerate into mere artfulness, or monomaniacal cunning; and it is to this morbid influence of the ovaria on the organ of the mind, that Dr. Laycock attributes the extraordinary instances of monomaniacal cunning in females, on

[1] Journal of Psychological Medicine, Jan. 1851, p. 31.

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record. He observes, on this head, 'of all animals, woman has the most acute faculties; and when we consider how much these may be exalted by the influence of the reproductive organs, there is not much ground for surprise at the grotesque forms which cunning assumes in the hysterical female, although they have caused much speculation and astonishment. Insane cunning is usually exhibited in attempts at deception, but occasionally in a propensity to steal, or rather to steal slyly. It may be remarked that, when it occurs, it may be as much a symptom of hysteria as any corporeal affection whatever. It is a true monomania, and is most likely to occur in the female who is hysterical from excess of sexual development—*one possessing the utmost modesty of deportment and grace of figure and movement, for the modesty itself springs out of that feminine timidity to which I have just alluded.* Sly stealing, however, is most frequently observed in pregnant women.' The italics in the above quotation are our own," says Dr. Winslow, "as we wish to direct the reader's special attention to the important principle pointed out by Dr. Laycock. The propensity, in such case, is dependent solely on the excitement of the nervous system by the ovaria; hence it is that when, in consequence of an active condition of those structures, the graces peculiar to the feminine character are peculiarly developed, and gentleness, modesty, and timidity are prominent characteristics, often in those identical cases it is, that there is this morbid excitation of the instinct of artfulness or cunning; and it is these endowments which explain the influence that hysterical girls have upon all that come near them, and which is really astonishing; parents, women, physicians, all yielding to them. It is also the marked excitation of this sexual artfulness, which renders nugatory all the experiments and labors of those mesmerists, whose principal subjects are young females or youths about the age of puberty. Psychologists, practically acquainted with this subject, can place no reliance upon the statements of the hysterical females upon whom mesmerists experiment, however well educated, gentle, good, and truth-loving they may be naturally, and really are in all other matters. Physicians have recorded numerous instances of strange and motiveless deceptions, thefts, and crimes practised by young women, even by ladies of unexceptionable morals, excellent education, and high rank. Fasting women, ecstatica, sly poisoners, pilfering lady-thieves, &c., present examples of this kind; particular instances we need not mention, as they may be found in most works on hysteria, and often occupy a niche in the newspapers.

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When cunning is combined with a morbid excitation of the propensity to destroy, such as is manifested in the females of brutes, the effect is sometimes dreadful, and is seen in the perpetration of secret murders by wholesale poisoning, or in secret incendiarism; and if other natural instincts be perverted, the objects of woman's warmest and most disinterested affections may perish by her hand. It is a singular fact, in natural history, and remarkably illustrative of our views, that parturient domestic animals sometimes suffer from the same morbid condition of the nervous system as the human mother, and they also destroy their offspring. Thus," as we have already had pointed out by Mayhew, "cats, sows, and bitches have been known to eat their litter; cows to butt their calves to death, hens chase their chickens, &c.

"When cunning is combined with a morbid state of the temper, the misery inflicted upon domestic peace is inexpressible. The ingenuity in malice and falsehood, displayed by the patient, is most extraordinary; so extraordinary, indeed, that it is never credited until it is experienced. Cases are by no means infrequent in which the sufferer from this sad derangement is the most intellectual and most amiable of the family; beloved by all, respected, almost worshipped. Hence, when, after numerous struggles to repress them, the propensities, excited into such fearful and almost supernatural activity, by the ovarian irritation, burst forth beyond all control, and the pet of the family is seen to be the opposite, morally, in every respect to what she had been—irreligious, selfish, slanderous, false, malicious, devoid of affection, thievish in a thousand petty ways, bold, may be erotic, self-willed, and quarrelsome—the shock to the family circle and friends is intense; and if the case be not rightly understood, great, and often irreparable mischief is done to correct what seems to be vice, but is really insanity.

"Perhaps in the whole range of psychology there is no subject so deeply interesting as this; for it is in so-called moral insanity that man's spiritual and moral nature is the most awfully and most distressingly subjected to his corporeal frame. It is a disease, undoubtedly, much more frequent in the female sex than in man."[1]

"Dr. Harvey," resumes Dr. Montgomery, "mentioned the case of a lady who, whenever she was pregnant, became affected with the most uncontrollable passion for building; this had taken place several times, and always subsided when pregnancy ceased. A

[1] Journal of Psychological Medicine, Jan. 1851, pp. 31, 43.

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marked change in the temper is very commonly observed, so that a woman who was, under ordinary circumstances, extremely mild and sweet tempered, immediately becomes, when pregnant, irritable and capricious, an effect which in some women attends each recurrence of pregnancy."[1]

These are clearly and distinctly, to the extent to which each of them goes, cases of a monomaniacal character; which character, in itself considered, is not affected by the possibility of the affection in some cases being intermittent, paroxysmal, or periodical, while in others it is chronic and persistent. There are other abnormal manifestations, even of special sense, of whose occurrence abundant evidence can be afforded.

There is a simulation of disease which occasionally accompanies pregnancy and depends apparently on disturbance of the nervous influence, which sometimes very remarkably affects the functions of some of the organs of the external senses, in which no appreciable organic change can be at the time discovered; and that none such does really take place, seems sufficiently evident from the fact that the affection lasts only during gestation. Thus, instances of temporary amaurosis induced by pregnancy are by no means uncommon.[2] "I saw a lady thus affected," says Montgomery; "she could see certain objects distinctly, as a line drawn on paper; others appeared confused, and some she could hardly discern at all; occasionally, she imagined she saw objects which were not present, as a person crossing the room, or flower-pots, or bunches of flowers on her table, when nothing of the sort was there. Salmutius relates a case in which a lady became blind every time she was pregnant, and recovered her sight as soon as she lay in.[3] Beer saw a young Jewess, who at the very beginning of her first three pregnancies, which followed each other quickly, regularly became amaurotic, and continued blind till after delivery; but on the third occasion she did not recover her sight.[4] Chambon ascribes these affections to plethora, but such an explanation is scarcely consistent with the occurrence of amaurosis from protracted or undue lactation, when the constitution is in a state of great debility and exhaustion; two well-marked instances of which I saw in two sisters,

[1] Loc. cit., p. 278.

[2] Good: Study of Medicine, iv. p. 247; Cooper: Surgical Dictionary, art. Amaurosis.

[3] Cent. III. Obs. 27.

[4] Lehre von den Augenkrankheiten.

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who quickly recovered their sight by weaning their children. Dr. Mathews, of Moate, has just informed me," continues our author, "of the case of a lady who, when five months pregnant, for the first time sustained total loss of voice, which she recovered at the time of her labor. Gardien notices this part of our subject fully, and mentions a variety of affections which I have not met with.[1] Dr. Bennewitz has detailed the particulars of a case, in which a young woman was, in three successive pregnancies, affected with diabetes mellitus; which, each time, completely ceased on delivery, but again returned when she became pregnant."[2]

These physical derangements, of reflex and uterine causation, are sometimes extreme. Thus it is not unusual, during the existence of pregnancy, to find the power of one or both of the lower limbs more or less impaired; and, in some few rare instances, they have become partially or completely paralytic, and even hemiplegia has been observed. "To what degree," says Montgomery, "the mere enlargement of the uterus is the agent in the production of such a state (by mechanical pressure) seems very doubtful, especially as we sometimes find the paralysis affecting the upper extremities;[3] the blood drawn under such circumstances has been observed to present highly inflammatory characters; but whatever measures may be adopted, the affection is never perfectly removed until after delivery, from which it would appear to depend on cerebral disturbance, originating probably in uterine irritation, and referable to the state of pregnancy as its specific cause."[4] Of course such cases are to be distinguished from those of paralysis occurring during or after labor, in consequence of apoplectic convulsions, or from undue or long-continued pressure upon the pelvic nerves by the fœtal head.

The evidence that I have now presented proves more than that the state of pregnancy is one subject to grave mental and physical derangement, giving rise to serious anxieties, and requiring judicious treatment. It proves, also, that at the foundation of the whole matter lies an excited uterus. The excitement that, during pregnancy, may coexist, as a normal and physiological state, with the usual or improved health, may, in other cases, assuming a patho-

[1] Traité des Accouchemens, i. p. 437, and ii. 76.

[2] Osam: Clinical Report for 1823; Edinburgh Medical Journal, xxx. p. 217; Montgomery, loc. cit., p. 47.

[3] Edinburgh Monthly Journal, xli. p. 492.

[4] Loc. cit., p. 5.

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logical type, or in the presence of pathological adjuncts, cause the inception or development of severe disease. In other words, the tendency to reflex derangement, whether of body or mind, usually attending uterine disturbance, but also usually controlled during pregnancy by the vis medicatrix of impregnation, may at times during this period, assume its primal sway, and produce effects, under other circumstances, naturally to be expected.

If we change the premises, the same result obtains. I have assumed the excited uterus as a natural cause of reflex disease, as is proved by its conduct at times other than pregnancy, and have shown that the diseases of pregnancy are but the special diseases of other times allowed to exhibit themselves here. Let us now shift the scenes of proof, and assuming pregnancy, however occasionally permitted to occur, as the normal condition of the adult woman, and its processes uninterfered with and as usually presenting themselves to be strictly physiological in their character, we will compare its diseases, physical and mental, with the special affections of women occurring at other times. They are found to be nearly identical in type, in detail, in their general course and result; a similarity of effect argues an identity of cause. Whichever horn of the dilemma is then selected, its point is the same. If an excited uterus causes the derangements of pregnancy, so it does those of other special times and seasons. If an excited uterus causes the latter, it is, by the same mechanism and same reflex causation as that by which the former are occasioned.

As to puberty, for instance: I will quote a word from Dr. Ray. "That the evolution of the sexual functions," he says, "is very often attended by more or less constitutional disturbance, especially in the female sex, is now a well-established physiological truth. The shock seems to be felt chiefly by the nervous system, which experiences almost every form of irritation, varying in severity from the slightest hysterical symptoms to tetanus, St. Vitus' dance, and epilepsy. And when we bear in mind, also, that general mania is sometimes produced by this great physiological change, it cannot be deemed an extraordinary fact that partial mania, exciting to acts of incendiarism or murder, should be one of its effects."[1]

Just as puberal mania may thus be produced, so may there occur the first explosion at any other of the periodic crises, of longer or shorter interval, to which we have seen woman is constantly liable.

[1] Medical Jurisprudence of Insanity, p 200.

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The climacteric invasion of insanity has very lately been studied by Dr. Francis Skae, formerly attached to the Royal Asylum at Morningside,[1] and it is to be hoped that we may soon have memoirs upon each of the other developmental types to which I have already alluded.

I have now shown that both *à priori*, and from the evidence of experts in insanity, there is reason to believe that their sex lies at the foundation, physiologically and pathologically, of much of the mental derangement that occurs in women. I am well aware that the work has been but imperfectly performed; had space and a fair allowance for the patience of the Association permitted, I should have presented much additional proof that I am, at present, compelled to withhold.

Negative evidence, no matter what its amount or from what quarter afforded, should not, I would respectfully submit, be allowed to weigh against the positive proof that I have afforded, yet the arguments that can alone be brought to disprove my position are strictly and merely negative in their character. It will be sufficient if I refer to merely one or two of them; from an example we may understand its class.

It has been stated by several writers, I have already quoted Dr. Earle's opinion upon the subject, that the regular occurrence, absence, or suppression of the catamenia seems in many cases to have made no difference as to the causation, continuance or cure of insanity in women, and that therefore the uterus and ovaries are proved incapable of exerting any appreciable influence as an agent in the production of the mental disease. The error that is here present is an evident one: it is in considering that in all uterine or ovarian diseases there must be derangement of a single function, that of menstruation; or that the presence and partial or complete performance of this function argues uterine health. Such an argument only proves most lamentable ignorance, even of the most common and simplest of the diseases of women, and of which the youngest medical student of the present day would be ashamed.

Again, it must not be forgotten that the diseases special to women are now recognized to embrace a vast variety of simple and complex lesions, equalling in number, if not excelling, those of any other organ or system of organs in the body. The wise physician of old was not far wrong in his judgment: "What is woman? Disease, says

[1] Edinburgh Medical Journal, Feb. 1865, p. 703.

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Hippocrates."[1] The absence of one disease, of whatever class in any given patient, is no evidence that another may not exist. Am I wrong, then, in advising more careful examinations than are commonly made, even in general practice?

Still further, it has been asserted, that because many insane women make no complaint of pelvic pain, we ought, from that fact, to take for granted the non-existence of uterine disease. This statement would hardly be made were it recollected, for every medical man, however long retired from active practice, must once have known, that even among sane patients cases are not so very uncommon of advanced and decided uterine disease when the only pains present are reflex, and exhibited merely as distant neuralgias, of the back, face, breast, or other location. Indeed, I may state that I have seen, in more than one instance, the uterus nearly destroyed by malignant disease, without a trace of the lancinating pain that authors have too much insisted upon as necessary, however generally pathognomonic when it does exist, and the patient hardly aware of any local discomfort. That such cases do occur in the sane only strengthens the argument I have elsewhere dwelt upon, quoting Bucknill and other authorities; that while the peculiar tolerance of pain, so often observed in the insane, is now allowed frequently to veil the existence of phthisis and similar forms of organic disease, just as it does of wounds and injuries, so must it be granted that at times there may exist and progress any and every form of uterine and pelvic lesion without its coming to the knowledge of the physician or asylum superintendent, unless he suspect its occurrence and search therefor.

As a single instance from many that might be given, I append a statement by Dr. Tuke, now attached to the Royal Lunatic Asylum, at Morningside, near Edinburgh. In presenting to the Edinburgh Obstetrical Society at its meeting in January of the present year, specimens of fibroid tumors and polypus of the uterus, removed, post-mortem, from a woman who had been in the asylum for twenty years, without ever making complaint of pelvic disturbance, this gentleman remarks: "I was not aware of the existence of the tumor until I examined her amongst other patients, making a careful investigation into the bodily health of all the old inmates, with the view of discovering diseases which are liable to lie latent

[1] Michelet: L'Amour.

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in the insane, to an extent hardly to be credited by any but those accustomed to their treatment."[1]

And, finally, I have been told by some gentlemen, that because many women have disease of the uterus, detected during life, without insanity—and by others, that because at autopsies of other sane patients, similar disease, undetected during life, because unlooked for, has been discovered; so must it therefore be admitted, that it is impossible that diseased conditions of the pelvis and of the brain can have any dependence upon each other. Upon just such absurdities as these, for I can honestly apply to them no milder epithet, have many of the dogmas of psychologists been founded. As well might it be asserted, that because some persons with musket wounds have recovered, therefore a bullet never kills; or, because in some others, as in the late eminent geologist, Hugh Miller, for instance, extreme cerebral disorganization has, for a while, coexisted with apparent mental integrity, that, therefore, such disorganization is the normal condition of the brain, or can never be, at any rate, the cause of mental disturbance. And yet, it is by just such baseless objections, that gentlemen, professing to seek only the advance of medicine and the cure of patients, have endeavored to prevent a more natural treatment of insane women than that now generally obtaining.

There are many questions, directly presenting themselves in this connection, interesting equally in their practical and their scientific relations, upon which I have much to say, but whose discussion I must defer to another occasion. Such, among others, are the following:—

1. The effect of celibacy, of marriage, of widowhood, as causing insanity in women.

2. The transmissibility of insanity as an inheritance by the mother, as compared with it by the father.

3. The occurrence of uterine disease in the mother, as rendering the transmission of any family taint of insanity more probable to her offspring.

4. The frequency of organic cerebral disease in insane women as compared with it in insane men.[2]

5. The epidemics of Tarentism, convulsions, suicide, exhortation,

[1] Edinburgh Medical Journal, March, 1865, p. 857.

[2] "Female insanity is in a large proportion of cases merely a reflex disturbance of the brain. Insanity in men much more extensively involves cerebral lesion, and their mortality is proportionately increased."—Workman: Toronto Report, 1860. *American Journal of the Medical Sciences*, April, 1863, p. 437.

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etc. etc., which, occurring among females, have at times so vexed the religious and profane worlds.

6. The special propensities of invalid women to breach of the law or of propriety, as in the so-called pyromania, klepto-, dipso-, erotomania, whether this last be for a real or imaginary object, etc. etc., and their responsibility therefor.

7. The possibilities of a longer incubation of insanity, for special causes, in invalid women than would probably be thought creditable.

8. The periodicity of insanity in women, and the various lengths of the attack and the interval; in some instances bounded by a single catamenial period, in others by the space of gestation, of lying-in, of lactation, or the whole cycle of uterine life, from puberty to the final climacteric.

9. The time of development or explosion of an hereditary predisposition to insanity; its frequent coincidence with a special epoch in woman's life.

10. Epilepsy in women, with or without the addition of decided insanity or its previous existence as a family taint; and the legal responsibilities of female epileptics.

I had prepared from my own note-books the histories of quite a number of cases, illustrating several of the special points now indicated, which I had intended here to present, in connection with the very interesting series published not long since by Dr. Azam, physician to the asylum for insane women at Bordeaux; but my paper is already so long that I must omit them. I cannot, however, refrain from quoting the last of Dr. Azam's conclusions, so completely does it coincide with my own conviction and my own experience.

"Every other treatment than physical will prove useless so long as the organic lesion persists, and this will have so much the greater chance of being effectual as it is resorted to at a time approaching the commencement of the disease."[1]

VIII.—INDICATIONS OF TREATMENT.

My remarks, present and past, upon the causation of insanity in women have been elicited, as will long since have been perceived,

[1] De la folie sympathique provoquée et entretenue par les lésions de l'utérus et de ses annexes.

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by the need, as it seems to me, of urging upon the profession a more rational treatment in public and private practice, of female lunatics. My views upon the subject are not the result of any hasty and ill-based impression, but they are matured, and from somewhat extensive observation. Without the slightest presumption, I think I may here say, that I know whereof I do affirm. I cannot at this time go into the detail that I would gladly do, and that I intend doing at no long subsequent period; but I shall at least show, as I think indeed I have already done, that the field now endeavored to be opened to the practical purposes of the profession is one that, though hitherto neglected, is yet one of the richest in medicine.

As has hitherto been done in this communication, I shall endeavor to present the little I have time to say concerning treatment, through the language of superintendents themselves.

An author whom as yet I have hardly referred to, Dr. Conolly, of the Asylum at Hanwell, while taking the general ground of non-restraint, seems to have been struck by the eminently sad condition, under the best of care, of lunatic women as compared with lunatic men. I cannot better introduce the little I can say in this especial connection, than by the following extract.

"The precise condition of the brain in different patients," says Dr. Conolly, "is, it has been acknowledged, as little known as the mode and nature of its actions in health. The manner in which its functions are interrupted or disordered in insanity, lies in a region beyond the reach of man's senses, and seems scarcely a legitimate object for strictly philosophical imagination, unaided by any means of appreciating it, and leading merely to 'wandering thoughts and notions vain.' But the connection of these actions with material organs, and their evident sympathy with the body in health and in disease, impart certain resources to the physician; who, if he can only act directly on the mind within narrow limits, finds that he can extensively and powerfully influence it by sedulous attention to the state of the temple in which, in this condition of existence, it is enshrined."[1]

Let us see what until very lately has been this "sedulous attention to the state of the temple of the mind," so justly deemed necessary by Dr. Conolly. I shall first quote from an official English report of but a few years ago, with the simple comment that what

[1] Treatment of the Insane, p. 164.

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then existed in Great Britain still exists, to our disgrace, in many places in this country.

"In one of the cells for the women, the dimensions of which were eight feet by four, and in which there was no table, and only two wooden seats, we found three females confined. There was no glazing to the window, and the floor of the place was perfectly wet with urine. The two dark cells which joined the cell used for a day-room, are the sleeping places for these three unfortunate beings. Two of them sleep in two cribs in one cell. The floor in the cell with two cribs was actually reeking wet with urine, and covered with straw and filth. There is no window, and no place for light or air except a grate over the doors."[1]

Ten years later than the date of the report from which the above is quoted, it was my fortune to be residing in Scotland, when its lunatic asylums, public and private, were subjected to the official scrutiny that had been instigated by Miss Dix. The descriptions already given and to follow are in no respect an exaggeration of what, in many quarters, was found to exist. Among the foremost in promoting that investigation was my instructor, Prof. Simpson; and it was the facts that then came to my knowledge, that first called my attention to the necessity of more thoroughly studying the causation and treatment of insanity in women. I will present a true picture from an unbiassed observer.

"The first common room you examine, measuring twelve feet long by seven wide, with a window which does not open, is [perhaps] for females. Ten of them, with no other covering than a rag round the waist, are chained to the wall, loathsome and hideous; but, when addressed, evidently retaining some of the intelligence, and much of the feeling which, in other days, ennobled their nature. In shame or sorrow one of them perhaps utters a cry; a blow, which brings the blood from the temple, the tear from the eye—an additional chain, a gag, and an indecent or contemptuous expression, produce silence. And if you ask where these creatures sleep, you are led to a kennel eight feet square, with an unglazed air-hole eight inches in diameter; in this, you are told, five women sleep. The floor is covered, the walls bedaubed, with filth and excrement: no bedding but wet, decayed straw is allowed; and the stench is so insupportable, that you turn away and hasten from the scene."[2]

[1] Report of the English Commissioners in Lunacy for 1844.

[2] Browne: What Asylums were, are, and ought to be. Edinburgh.

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"Indeed it would almost seem," says Dr. Conolly, "as if, at the period from the middle to near the end of the last century,[1] the superintendents of the insane had become frantic in cruelty, from the impunity with which their despotism was attended. Some of the German physicians meditated even romantic modes of alarm and torture; wished for machinery by which a patient, just arriving at an asylum, and after being drawn with frightful clangor over a metal bridge across a moat, could be suddenly raised to the top of a tower, and as suddenly lowered into a dark and subterranean cavern; and they avowed that if the patient could be made to alight among snakes and serpents it would be better still. People not naturally cruel became habituated to severity until all feelings of humanity were forgotten. I used to be astonished, even seventeen years ago, to see humane physicians going daily round the wards of asylums, mere spectators of every form of distressing coercion, without a word of sympathy, or any order for its mitigation. But men's hearts had on this subject become gradually hardened. In medical works of authority, the first principle in the treatment of lunatics was laid down to be fear, and the best means of producing fear was said to be punishment, and the best mode of punishment was defined to be stripes. The great authority of Dr. Cullen, certainly one of the most enlightened physicians of his time, was given to this practice, although his theory of madness was that it depended upon an increased excitement of the brain.

"Thus, by degrees, restraints became more and more severe, and torture more and more ingenious. Among many cruel devices, an unsuspecting patient was sometimes induced to walk across a treacherous floor; it gave way, and the patient fell into a bath of surprise, and was there half drowned and half frightened to death.[2]

"In some continental asylums the patients were chained in a well, and the water was allowed gradually to ascend, in order to terrify the patient with the prospect of inevitable death. Other methods adopted, even within the last sixty years, for controlling the phenomena of insanity, can only be regarded as tacit acknowledgments of the general inefficiency of medicine, and of the coarse

[1] We have seen that examples like those referred to have not entirely been unknown in the present century.—H. R. S.

[2] It was with reference to this bath of surprise, which was said to have effected actual cures, that Esquirol remarked, justly enough, "I should as soon think of recommending patients to be precipitated from the third story of a house, because some lunatics have been known to be cured by a fall on the head."

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determination of vain or ignorant men to effect by force what they could not accomplish by science. We read with almost as much amusement as wonder the respectful acknowledgment of Dr. Hallaran, that Dr. Cox made known to the profession the 'safe and effectual remedy' of the circulating swing, the invention of which Dr. Cox 'generously gives the credit of' to Dr. Darwin; this invention being one by means of which the maniacal or melancholic patient, fast bound on a sort of couch, or in a chair, was rotated at various rates up to one hundred gyrations in a minute. This machine was used with two indications; the horizontal position being adopted when the object was to procure sleep; and the erect posture, the other failing in cases of excitement, to procure intestinal action. It is acknowledged that patients once subjected to the swing were ever afterward terrified at the mention of it; that it lowered the pulse and the temperature to such a degree as to alarm the physician; that it occasioned a 'disagreeable suffusion of the countenance,' frequently leaving an ecchymosis of the eyes; that it acted as an emetic, and as a hypercathartic; but still it was lauded as reducing the unmanageable, and, stranger still, as causing the melancholy to take 'a natural interest in the affairs of life.' It is curious to be told, also, that the inconvenient effects mentioned were induced more certainly when the patient was in the erect position. Worse consequences occasionally resulted, I believe, from this barbarous invention; which probably rendered Dr. Hallaran's recommendation, that no 'well-regulated institution intended for the reception and relief of insane persons' should be unprovided with a machine of that description, ineffectual. Allusion is made to the practice in Esquirol's work,[1] in which he describes 'la machine de Darwin' as resembling the *jeu de bague*, or treadmill, and he speaks of it as having passed from the arts into medicine. It found some temporary favor on the continent; but the violent evacuations produced by its employment, followed by fainting and excessive debility, led to its disuse. Dr. Cox had advised its being used in some 'hopeless' cases, in the dark, with the addition of unusual noises, smells, &c., that every sense might be assailed; but I do not think that this advice was ever acted upon."[2]

In the women's galleries in Bethlem, the same author tells us, they found in one of the side rooms "about ten patients, each chained by one arm or leg to the wall; the chain allowing them merely to stand up by the bench or form fixed to the wall, or to

[1] Conolly, pp. 12–15. [2] Loc. cit., vol. i. p. 156.

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sit down on it." For a dress, each had only a sort of a blanket-gown, made like a dressing-gown, but with nothing to fasten it round the body. The feet were without shoes or stockings. Some of these patients were lost in imbecility, dirty, and offensive; associated with them were others capable of coherent conversation, and sensible, and accomplished. Many women were locked up in their cells, chained, without clothing, and with only one blanket for a covering.[1]

"At that time, when a young and accomplished woman, for example, affected with acute mania, violent, noisy, mischievous, regardless of cleanliness, arrived at a large asylum, she was forcibly undressed, fastened down on loose straw, had strong medicine forced down her throat, and was then left and neglected for many hours. The straw tortured her from head to foot, but she could not move her hands. Her position galled and fretted her; but her feet were fastened, and she could not change it. Sickness and purging were produced by the medicine; and she was permitted to lie for twelve hours in a state of indescribable distress, then taken up, laid on the stone pavement, mopped or broomed, and, last of all, when quite subdued and half dead, had, perhaps, a bath and some few decent attentions."[2]

And again, "the history of each patient, and the afflictions which had caused their minds to give way, would now receive attention in all good asylums. But the day had not arrived for such kind sympathies, and on arriving at the large and crowded house the patient was undressed, with small show of gentleness, by several young women, and placed at once in a crib, on straw, and fastened to it by the feet, her hands being confined by iron hand-locks, and a tight waistcoat put around the trunk of the body and round her arms, the offices of the nurses concluding for the time with the administration of a dose of purgative salts. When the patient, not yet forgetful of the decencies of life, asked what she was to do if she wanted to get out of bed, the nurses, hardened by their vocation, merely answered her in the most vulgar terms. Having, in this miserable restraint, become dirty, which was inevitable, the patient was taken out of bed, carried to the pump, and pumped upon with cold water, and then, undried, taken back to her crib, and fastened down again, but on fresh straw, an attention not then in all cases considered necessary. All her remonstrances to the

[1] Loc. cit., p. 26. [2] Ibid., p. 48.

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women about her were laughed at. Long afterwards she still remembered her own expressions and theirs, her appeals to them as women, her prayers for pity, and their too ready reply, which shut out hope—'You don't know what a mad-house is yet, but we will teach you.' In the same room there were, she remembered, several maniacs, all in chains or restraints of some kind, singing, swearing, beating the walls. This scene, and her aggravated wretchedness, made her worse; and as she could not get up and move about, she could only sing or shout aloud like the rest. For six weeks she was kept in that place of torment, and in those restraints; and, like most of the patients of those old asylums, the story of her restraints was written in broad indelible scars on her wrists, but in still worse characters on her memory."[1]

That such abuses, thus related by a superintendent himself, were more common with women than with men, there can be no question. It is still so, to the degree, more or less marked as this may be, to which they still exist. And there are reasons why it might be expected that such should be the case, as is implied by the author from whom we have been quoting.

"On the female side of the house," says Dr. Conolly, "where the greatest daily amount of excitement and refractoriness was to be met and managed, the cases of recent insanity in young women, and especially the cases of puerperal insanity, and those arising from lactation, were, perhaps, the first to attract particular notice in reference to the new system. Anywhere but where restraints are indiscriminately employed, such cases would seem the likeliest to be regarded with interest and compassion, and to be treated with gentleness. But as they are usually attended with a great degree of excitement, and with a lively propensity to every kind of mischief, and consequently occasion much trouble, these cases had become more especially and constantly subjected to severe coercion.[2]

"The subjects of this coercion were, some of them, women of middle age, who had been handsome, and who possessed considerable acuteness of intellect, ingenuity and activity, but whose lives had been a sort of troubled romance; profligate, intemperate, violent, regardless of domestic ties, their children abandoned to all the evils of homeless poverty, themselves by degrees given up to utter recklessness, they had been the cause of ruin and shame to their families, and the history of their wild life had closed with madness. Others,

[1] Loc. cit., p. 124.

[2] Ibid., p. 107.

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and not a few, were the victims of the vices of those of a station superior to them, and left at length to struggle with difficulties and mortifications and remorse, beneath which reason gave way. In these patients all violent methods produced greater obstinacy, greater determination to give trouble, to do mischief, and to commit all kinds of outrages.[1]

"Delicate young women affected with mania, were tied to the bed, or half-smothered by servant-women and men, or fastened down by sheets twisted into the shape of cables, and tightly bound round the body and round the bed. In this miserable condition cleanliness is neglected, and the patient suffers from heat and thirst, and becomes exhausted by vain struggles. The patient becomes rapidly emaciated and perfectly frantic. Nothing can allay the irritation created by the useless crowd, by the disorder of the room, and the closeness of the atmosphere, and all the horrors which in the course of a few dreadful days have been needlessly accumulated about the chamber of a patient laboring under an excited brain, and whose malady all these things do but increase. But in these unhappy cases the friends still often oppose measures of a different kind, preferring the absolute secrecy thrown over the malady before all sensible considerations. Their prejudices and weakness find support in the arguments or insinuations of the attendants, who are glad to be relieved from trouble, and who commonly neglect to provide against any danger, except by debarring the patient from muscular movement as much as possible, and as long as possible. If, happily, such cases are transferred to the care of attendants who have been taught not to rely upon, or even to have recourse to, restraints, the alteration effected in a day or two is such as to make it difficult to believe that the patient is the same person seen before. If the patient is removed from home to a tranquil asylum, the change is greater still. At home the patient is, perhaps, the cause of indescribable confusion: all domestic regularity is interrupted, the servants speak in whispers, the neighbors avoid the house. Days and nights are passed in anxiety or terror. But the patient who has unconsciously caused all this disturbance, becomes, when taken to an asylum conducted on good principles, quite an altered person; disturbing nobody, and behaving peaceably, and even seeming happy among new associates, and in scenes unconnected with the real or imaginary

[1] Loc. cit., p. 127.

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griefs of the home so lately quitted. Such sudden improvement certainly almost exceeds belief; but the instances of it are not even rare. Every physician conversant with practice in cases of insanity, must have witnessed these almost marvellous metamorphoses many times."[1]

Let it not be supposed that the fearful pictures I have now shown of the attention paid the most sacred of human temples by medical men are either overdrawn or from a wholly by-gone age. They merely represent what I have myself witnessed upon more than one occasion here in Massachusetts within the past three years. Such cases, resulting from the neglect or omission of the profession to prevent their occurrence, become in reality acts of commission upon its part. I make no reflection upon the management of asylums, for it is well known that gross abuses of the kind described are no longer permitted to occur therein—but there are hundreds of insane women in each of our States, some of whom have already been in hospitals, others of whom have never received even the partial and necessarily imperfect examination it is there customary to make, who are now under treatment outside these hospitals—or rather under no medical treatment whatever, but subject only to the brutalities of the town's officials, who have them in charge. For further evidence upon this subject, I need merely refer to the report of the Commission of which I was then a member.[2] If such outrages still exist in Massachusetts, there is reason to believe they are not wholly unknown in other States of the Union,[3] and it is the duty of the profession to look to it that they are at once made to cease.

I would not, however, while allowing the prevention at hospitals of the open abuse of female patients, be understood to admit that all is there accomplished that might and ought to be done—far from this—neglect, systematic and customary though it may be, of any means or measure that may tend to the cure of a patient, or a class of patients, is in reality almost as grievous a wrong as a harm intentionally inflicted. Between omission and commission

[1] Loc. cit., p. 329.

[2] Quincy, Hitchcock, and H. R. Storer: Report of the Commissioners on Insanity to the Legislature of Massachusetts. Pub. Doc., 1864, Senate, No. 72.

[3] The facts in the case are but too patent. They are acknowledged to exist in two other States at the present moment, in the very last number, for Jan., 1865, of the American Journal of Insanity that I have received. They undoubtedly exist in every State of the Union.

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there is at times but very little difference, as regards the injury that is done.

Let me here quote, as pertinent to this question, from the last report of the State Hospital for the Insane of California—a report characterized, by Dr. Earle, of the Northampton Asylum, as "essentially different in character from any other from the California hospital which has come under our observation; its particular object appearing to be an exposition of the defects of the hospital as a curative establishment."[1]

"Its beautiful edifice," says Dr. Tilden, the superintendent, "its well-cultivated yards and gardens, its wholesome food, its comfortable clothing, its scrupulously clean halls, rooms, beds and bedding, its excellent police regulations, combine in making a prison of the first class; and, if such was the original purpose, I see not how it could have been more admirably accomplished. If, however, in creating a charity so munificent, so noble, it was intended to establish an asylum, with hospital appliances, for the *cure*, as well as the care and safe-keeping of the insane, I am free to say it is, in my opinion, a most signal failure." And again, he says, "if there is any marked difference between it and a well-conducted State prison, it is in favor of the latter, from the fact that means of employment are provided for its inmates, while the inmates of the asylum spend their days in idleness." And again, "it will hardly be contended, I think, that our newspapers and a little gymnasium, with a solitary swing in the female department, can give the asylum of California a claim to the character of a curative institution."

"The general use of mechanical restraint," says Dr. Tuke, "arose from the idea impressed upon the keepers of asylums, no less by the highest authorities than by a venerable antiquity, that it was the necessary and best mode of treatment. It was connected," he continues, "with a theoretical ignorance of the nature and pathology of insanity."[2] The same should be said of the neglect to extend to an insane woman the same method of examination and of treatment, which would be considered imperative for the same woman laboring under any other possibly reflex form of disease.

I have quoted upon this point the pithy corollary of Dr. Azam, that for organic causative disease, physical means only are effectual;

[1] American Journal of the Medical Sciences, April, 1865, p. 445.

[2] Manual of Psychological Medicine, p. 76.

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and I have given the corroborative testimony of Dr. Tuke, regarding the chronic and supposed incurable cases of insanity in women now at the Morningside Asylum. Let me submit a word or two in addition from still other superintendents.

"With regard to the detection of internal disease," we are told, "great care is required, as many of those symptoms on which the practitioner generally relies as aids to diagnosis are wholly suppressed. Insane persons frequently evince either great insensibility to, or power of enduring pain, and hence the light afforded by painful and morbid sensations is absent in the internal and constitutional diseases affecting persons of unsound mind. From this cause, examinations after death occasionally reveal organic lesions and changes which had not previously been supposed to exist, and it requires careful attention to the physical signs present, and a close observation of disordered functions and constitutional peculiarities, in order to discover the disease which is, perhaps, secretly undermining the vital powers.[1]

"In the purely medical aspects of the subject," it has been remarked by the same author, "there appears in some quarters an indolent and ultra-expectant mode of regarding mental diseases, which, if pursued to its legitimate consequences, must end in the utter repudiation of medical science and skill in their treatment. For in the reports of some large asylums, I observe that medical treatment is intimated to be of little avail, one or two drugs being mentioned as the only medicinal agencies employed. If this be the correct principle, if medical science can afford no greater aid in the cure of insanity, it is surely incumbent on the medical officers who entertain these views at once to resign their appointments as such, and henceforth leave the care of the insane to persons of ordinary education. For my own part I entertain a very different opinion. I believe that even in this apparently unpromising department of medicine great results may be achieved; and that by a more perfect acquaintance with the laws regulating the phenomena of the healthy mind, by a more extended knowledge of the properties of the innumerable substances, natural and artificial, which are capable of acting upon the nervous structures, and through them upon the mental phenomena, and by a more careful investigation of the circumstances influencing the production of morbid changes in the nervous system, a merely disordered and structurally uninjured

[1] Robinson: Prevention and Treatment of Mental Disorders, p. 183.

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brain may be rendered as amenable to curative agencies as a disordered liver or kidney."[1]

"The medicinal treatment, therefore," says Bucknill, "must be founded, not upon the general resemblance of symptoms in different cases,[2] but upon their points of dissemblance, and upon the discrimination of ultimate diagnosis; not the primary diagnosis which recognizes a case of insanity, but upon the ultimate diagnosis which, as nearly as possible, refers the symptoms of each individual case to the exact pathological condition from which they arise."[3]

"What misfortunes," exclaims Esquirol, "and obstacles must those practitioners have encountered who have been only able to see one individual disease in all the insanities which they have had to treat! They were not ignorant that, delirium being symptomatic of almost all diseases when approaching a fatal termination, insanity might be also entirely symptomatic; they were not ignorant that there are instances of insanity evidently sympathetic; they knew that a thousand exciting and predisposing causes give rise to insanity; but paying no attention, except to the most obvious symptoms, they have permitted themselves to be imposed upon by the impetuosity, the violence, the mobility of these; they have neglected the study of the causes of insanity, and that of the relation of the causes with the symptoms. Under the domination of theories, some have only been able to see the existence of inflammation, have accused the blood, and abused the lancet; others, believing in irritating bile, have checked the secreting organs, and injured their functions. They have been prodigal of emetics and drastics. Some, having only taken into account the nervous influence, have given antispasmodics in excess. All have forgotten that the practitioner ought to have present to his mind grand general views—the systematic ideas which dominate, which constitute medical science, the art which ought especially to devote itself to a thorough knowledge of the circumstances, and of the symptoms, which are capable of disclosing the causes, the seat, and the nature of the malady which it has to combat. Often one must vary, combine, modify the means of treatment, for there is no specific treatment of insanity. As this malady is not identical in all persons, so it has in every individual its different causes and characters; so new

[1] Robinson: Prevention and Treatment of Mental Disorders, p. 225.

[2] It will be noticed what a blow is this remark to the usual system of classification.

[3] Loc. cit., p. 453.

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combinations are required, and a new problem is to be solved for each insane person under treatment."[1]

What grand general views, let me ask, what systematic ideas, what search for different causes and characters, and for new combinations, the resort to what means of solving the problem, do we find in the usual and most ancient method of treating insane women? That I am neither doing injustice by this question, nor venturing an opinion without a sufficient reason, I may be permitted to refer the profession to extended papers by leading authorities upon the subject, who may be supposed to have given a fair statement of the present methods of medically treating the insane. As instances in point, I will name Dr. Forbes Winslow's articles on the Treatment of Insanity, Ancient and Modern,[2] and on the Medical Treatment of Insanity;[3] those by Schroeder van der Kolk,[4] even the excellent one to which I have already referred in another part of this report, and that by Dr. Ranney, Physician to the City Lunatic Asylum of New York,[5] which enjoyed the honor of being reproduced, with the full discussion to which it gave rise at the meeting of American Superintendents, to whom it was first communicated, in one of the English psychological journals.[6] In none of them do we find recognition of the claims of a decided and special treatment for insane women, although, in the case of Winslow, it will be recollected that he had acknowledged the special causation of much of their mental disturbance, as suggested by Laycock.

I would not deny the occurrence in psychological literature of sentences like the following, for I have already quoted many of them; but they have as yet fallen without fruit, and dead. "Sex," says Dr. Robertson, "is doubtless an indication of treatment in the many cases connected with uterine disease."[7]

Dr. Conolly, as usual, here speaks sensibly and intelligibly. "The physician's office," he says, "is assuming in these times a higher character in proportion as he ceases to be a mere prescriber of medicines, and acts as the guardian or conservator of public and of private health; studious of all agencies that influence the body and the mind, and which, affecting individual comfort and longevity, act

[1] Maladies Mentales. [2] Journal of Psychological Medicine, Jan. 1850.
[3] Ibid., April, 1854.
[4] British and Foreign Medico-Chirurgical Review; American Journal of Insanity, July, 1860. [5] Ibid., July, 1857.
[6] Asylum Journal of Mental Science, April, 1858, p. 450.
[7] Asylum Journal of Mental Science, Jan. 1859, p. 277.

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widely on societies of human beings. Changes are gradually taking place even in special walks of medical practice, in conformity to the enlightened principles by which the exertions of the officers of general health are directed; and these principles find an application, and are strikingly illustrated, in the modern asylums and modern treatment of the insane. Obscurity may yet hang over the origin of mental derangement; the explanation of sudden recoveries may continue difficult; the alterations incidental to portions of nervous matter may baffle investigation, and the possible varieties in the condition of the blood, often apparently associated with mental disturbance, may be yet unknown, or incapable of satisfactory elucidation; but general means have been revealed to men of science, conducing to important modifications and ameliorations of mental malady."[1]

It is possible that I may be able to afford some light as to the frequency with which these means are at present resorted to in the case of insane women. I have spoken of the neglect of special measures, as in reality the prevalent treatment of insane women. Of such a method as is the present, Dr. Bucknill speaks as follows: "Although specific drugs are out of vogue," says this gentleman, "narrow and stereotyped modes of treatment are scarcely less dangerous; and in no class of disease does the treatment need to be more infinitely varied than in insanity. In other wide classes, some broad rules may be laid down for the treatment; and although physicians may differ respecting these rules, they will be found to adhere to one or other set of opinions respecting them. Thus, one feeds in fevers, another depletes; but in insanity, cases which present symptoms, at first sight, of close resemblance, demand most opposite modes of treatment; and cases which at first present symptoms most unlike, sometimes require to be treated in the same manner. An educated and exact observation is required to distinguish between the acute delirium which arises from cerebral hyperæmia, and that which arises from cerebral excitement in sympathy with intense irritation of some part of the periphery of the nervous system; or from the cerebral excitement which is but an expression of the defective nutrition of the organ from poverty of the blood; or cerebral excitement propagated to all parts of the organ from some focus of irritation, some *foyer* of disease in itself, as a small portion of inflamed substance or membrane, or the

[1] Treatment of the Insane, p. 79.

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structural mischiefs surrounding an apoplectic clot. In all these instances the symptoms may bear a strong resemblance to each other, and yet how different is the mode of treatment demanded in each of them."[1]

It has been asserted, that in claiming for insane women the same general principles of treatment by which we would conduct disease to a successful issue where the mind is unimpaired, I am myself endeavoring to substitute for the present general neglect, a narrow and stereotyped method of practice. Every one familiar with the modern treatment of the diseases of women, will detect and deny this wretched libel. It is just the man who does not treat symptoms, but searches faithfully and persistently for their ultimate cause, who is the true general practitioner—he, alone, who can avoid the charge of blind groping and routine.

In one of my previous communications upon insanity as of reflex causation in women, the statement was made, with all respect for the ability and zeal of those more especially engaged in the management of the insane, that little has as yet been undertaken or accomplished at our public hospitals for the cure of insane women.

"Does he mean to say," asks an anonymous critic, whom I have noticed only because he claims to have been both Assistant Physician and Superintendent of a New England Asylum, and to represent the opinion of a large circle of his fraternity—"does he mean to say that superintendents have not discharged, as cured, as many women as men? Where are the statistics?"[2]

To the statistics thus called for, although I have already in this communication expressed an emphatic belief as to their real value, I am yet not unwilling to refer.

I should have produced them ere this, had I not preferred that they should be called for by any gentleman who might venture to deny the justice of my conclusions. Those who appeal to statistics, cannot refuse to be governed by their evidence.

I proceed to draw additional proof of the correctness of my views concerning the management of insane women:

A. From the statistical evidence of asylums, and

B. From the direct evidence of those having asylums in charge.[3]

[1] Loc. cit., p. 452.

[2] Boston Medical and Surgical Journal, 5th Jan. 1865, p. 453.

[3] A portion of the evidence that will now be presented was read before the Suffolk District Medical Society of Boston on Jan. 28th ult. It was communi-

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A. In the first place, I would say that any remarks I may have made respecting the medical management of insane women at asylums, apply not merely to our own American hospitals, but to those of other countries also—so that no argument in disproof can be drawn from the comparisons I shall proceed to furnish, inasmuch as these, being based upon nearly identical data, can only afford identical results.

Secondly, I have no doubt, and I am willing to allow, that as many, or nearly as many women as men are yearly discharged from asylums. Any basis that may be named, the number of admissions, for instance, may be taken for the calculation. Selecting at random from a pile of hospital reports, I will give the results of the statistics of the Worcester State Hospital for the space of 30 years, from 1833–62. In a total of over 6000 patients, there were admitted 3273 males and 3390 females, and were discharged 2962 males, or 88 per cent. of the admissions, and 3078 females, or 89 per cent. of the admissions, a difference of 1 per cent. in favor of the women.

If we add the years 1863 and '64, the percentage is but slightly changed. In a total of over 7000 patients, we now have as admitted 3503 males and 3601 females, and as discharged 2910 males, or 81 per cent. of the admissions, a loss of 7 per cent., and 3005 females, or 81 per cent. of the admissions, a loss of 8 per cent.; the proportions of discharges in the two sexes being rendered exactly identical by the comparative loss of 1 per cent. by the women.

Thirdly. I have also no doubt, and am willing to admit, that as many, or nearly as many women as men are discharged from our hospitals as recovered. This, it will be noticed, is, however, a very different thing from being discharged as cured; and this again is by no means identical with being discharged cured.

cated to the *Medical and Surgical Journal* of that city as Article IV. of the series I had already initiated, upon the causation and treatment of insanity in women; the subject being one whose discussion many of the most distinguished physicians in this country are pleased to consider of the very highest importance. On the 15th of February I received the following note: "The editors of the Journal came to the conclusion, after the publication of the last article relating to this discussion, that enough space had already been given to it, and that they would decline any further communication on the subject." With this decision I have not found fault, the gentlemen referred to best understanding their own affairs. So many inquiries, however, concerning my enforced silence have been made of me by their subscribers who had seen my former papers, and by the gentlemen who were present at the reading of that herein embodied, that I should certainly have published through some other medium the facts here presented, had they not been so relevant to the main subject of the present report.

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If my views as to the psycho-pathology of women are correct, not only as many women as men ought to be discharged cured, but very many more. This, however, does not occur in practice.

To return to the question of relative recoveries. At the Worcester State Hospital, during the 30 years first mentioned, and upon the basis of admissions then existing, namely, 3273 males and 3390 females, there were discharged as recovered, 1493 males, or 44 per cent. of the admissions, and 1618 females, or 45 per cent. of the admissions; a difference of 1 per cent. in favor of the females.

Adding again the years 1863 and '64, we have an admission of 3503 males and 3601 females, and a discharge as recovered, of 1612 males or 45 per cent. of the admissions, a gain of 1 per cent., and 1751 females, or 49 per cent. of the admissions, a gain of 4 per cent.; showing a difference of 4 per cent. in the females, and a comparative gain of 3 per cent.

At the Southern Ohio Lunatic Asylum, for the nine years from 1855–64, there were admitted 497 males and 499 females; of whom were discharged as recovered 261 males, or 57 per cent. of the admissions, and 251 females, or 50 per cent. of the admissions; a proportion of 7 per cent. in favor of the male.

At the Taunton State Hospital, for the nine years from 1853–62, there were admitted 1044 males and 1004 females, and were discharged as recovered 404 males, or 38 per cent. of the admissions, and 335 females, or 30 per cent. of the admissions; a proportion of 8 per cent. in favor of the male.

If we tabulate the results of these three hospitals, we have for the years first considered, a total of nearly 10,000 patients admitted, of whom 4814 were males, and 4933 were females. Of the former there were discharged as recovered 2158, or 42 per cent., and of the latter 2204, or 44 per cent.; a difference of 2 per cent. in favor of the female.

Adding to this the years 1863 and '64 at the Worcester Asylum, our total number of patients admitted becomes 12,000; 6844 being males, and 5104 females. There were discharged as recovered 2277 males, or 31 per cent., a loss of 11 per cent., and 2337 females, or 44 per cent., the proportion here remaining the same. The difference of 13 per cent. which had been relatively gained by the women, and which at first sight might have seemed an absolute gain, being found upon comparison to be exactly neutralized by the loss in recoveries of the men.

The statistics that have now been given were, as I have said,

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taken at random from many reports before me, and may undoubtedly be considered as representing the truth, *such as it is*. They show, it will be noticed, an apparent variation of the ratio of recoveries in insane women at the different hospitals—ranging from 50 per cent. at Dayton to 30 per cent. at Taunton—a variation to be explained in part, by the different probable character and nationality of the patients at the two hospitals: if at all attributable to difference in treatment, it may partly be owing to the fact, as is well known, that Dr. Gundry has paid much attention to insanity as caused by or coincident with the puerperal state. These variations, however, but tend to make the mean that I have presented, the more reliable in reference to the actual percentage of recoveries of insane women at asylums.

I could have furnished a computation upon a very much larger scale had it been necessary; that given is, however, sufficient for every practical purpose, more especially as I have granted all that could by any one be claimed; namely, that at our hospitals as many insane women as men are discharged as recovered.

It will not be uninteresting, however, to compare these results with what obtains abroad; a comparison that so far as I am aware has never yet been made.

At the York Retreat, in England, as appears from a table furnished by Tuke, and covering a period of 51 years, from 1796 to 1857, the average proportion of recoveries as compared with the admissions was 49.54 per cent. of males and 49.50 per cent. of females, the numbers being almost exactly identical.[1]

It was Dr. Thurnam's opinion, as we have already seen, that the proportion of recoveries of women exceeded those of men by about 20 per cent., indeed he is said to have estimated this excess as high as 50 per cent. A most surprising difference as compared with the results I am now presenting.

At Bethlem, during ten years, 53.8 per cent. of the men recovered, and 54.4 per cent. of the women; an excess of .6 per cent. in favor of the latter.[2]

At St. Yon, near Rouen, in France, the difference in favor of the women has been rated at 3 per cent.[3]

In most of the French asylums it has been thought that the

[1] Psychological Medicine, p. 201.

[2] Hood: Statistics of Bethlem Hospital, p. 73; as corrected by Tuke, loc. cit., p. 262.

[3] Parchappe: Notice Statistique sur les Aliénés de la Seine Inferieure, p. 44.

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males, discharged as recovered, exceeded the females by about 6 per cent. It is possible, however, that in some instances these computations may have been made by comparison with the total number of discharges, as was the case in the English statistical tables presented by Farr. The excess referred to has been noticed by nearly all the directors of asylums in France, and has been explained in various ways. By some it is regarded as due to "a humane sentiment, which induces the physicians of these establishments to shorten as much as possible the period of confinement for the men, whose labor is oftentimes indispensable to the maintenance of their families; and, on the other hand, to detain the females, giving them the protection of the asylum as long as possible, in view of their greater helplessness, and of the dangers to which many would be exposed on their return to society;" a detention which, besides, by preventing to a certain extent their marriage, would tend to check the transmission of a predisposition to the disease by inheritance.

"But," says Legoyt, "ought we not rather to attribute this difference to the greater or less severity of the disease itself, depending upon the difference in causes which induce insanity in the two sexes?"[1]

I allow the validity of the explanation by which the apparent disparity is done away, calling attention only to the admission that insanity in the two sexes may be owing to a constantly frequent difference in cause.

Thus far, it has been shown that the discharges of women from hospitals, as recovered, is about equal to that of men. Let it not be supposed, however, that this is necessarily a proof that—1st, these recoveries are always cures; 2d, that they comprise all the women who might be cured; or, 3d, that they are evidence that all justifiable resources of medicinal treatment have been put in requisition.

I propose, on the contrary, by pursuing the investigation a little further, to show the opposite.

1. Are these recoveries always cures? It is a delicate question that I am now approaching; but I rely upon the good nature of those interested in the matter who are my personal friends, and upon the fairness of all others, that they take no offence where none is intended.

In view of the coincidence already shown to exist, as regards

[1] American Journal of Insanity, April, 1861, p. 424.

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the relative recoveries of the two sexes in asylums, at home and abroad, I may be permitted to seek evidence from foreign sources, inasmuch as minute data have not yet been afforded to any extent from within our own asylums. An identity of result may of course be supposed to have been occasioned by similarity of cause.

At some foreign establishments, nearly one-third of all the patients treated are set down as cures, while in others only 3 or 4 per cent. of the recoveries are claimed as the result of treatment.[1] As this statement is given from Legoyt's statistics, by his translator, the well known physician to the Long Island Asylum at Sanford Hall, without objection or other comment, the fact is probably not materially different from what may be supposed to obtain in this country also.[2] No exception seems to have been taken to the statement, by any other of our writers on insanity during the nearly four years since these statistics were reproduced by Dr. Barstow.

The difference, to which I have referred, is supposed to be due partly to accidental circumstances, appearing and disappearing at different asylums at different periods of time, partly to the diversity of curative measures or of the hygienic conditions by which patients are surrounded, and partly to the longer or shorter period of residence at the asylum which each physician may order as requisite for his patient.

"This may be done on the part of the physician as a result of enlightened experience and observation, or in view sometimes of the material interests of the institution of which he has the charge. We may suppose, for example, that where the number of beds is found inadequate to the wants of the service, and where maintenance of a very large number of patients is at the public expense, their discharge is more easily authorized at the first well-marked symptoms of returning health, than where such maintenance is a source of income to the establishment."[3]

It is allowed, then, by alienists of acknowledged authority, that these so-called recoveries are not *always* cures. Are they generally so? Before entering upon this question, evidence may be interesting as to what has been supposed the curability of the insane, positive and comparative, as to sex.

In the report of the Massachusetts Commissioners on Lunacy

[1] Deductions from the Statistics of the Establishments for the Insane in France, for the twelve years from 1842 to 1853 inclusive.

[2] American Journal of Insanity, April, 1861, p. 423.

[3] Ibid.

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for 1854–55, which is a model of statistical research, it is stated that there were of insane men, native and foreign, in Massachusetts, 1,259; and of insane women, 1,373. Of the men, 181 were considered curable, and 1,005 incurable; leaving 73 unaccounted for. Of the women, 225 were considered curable, and 999 incurable; leaving 149 unaccounted for.[1] Or, in other words, 14 per cent. of the men were considered curable, against the 44 per cent. discharged as recovered from the Worcester Hospital; and 16 per cent. of the women, against 45 per cent. These facts are the more interesting, as the writer of that report is also a Trustee of the State Hospital at Worcester, whose statistics have therefore undoubtedly passed under his own careful scrutiny.

It may be urged that this is hardly a fair basis for comparisons, as Dr. Jarvis's estimates were of the whole insane in Massachusetts, whether at hospitals or at home. Fortunately, he has provided us with other and more pertinent elements of computation. At the time referred to, 1854–55, there were in the Massachusetts hospitals for the insane, 522 men and 619 women. Of the men, 85, or 16 per cent., were considered curable; and of the women, 109, or 17 per cent.; the ratios being almost identically the same.[2] Is it proper, then, to compare these two classes of statistics—the proportion of discharges as recovered, with the whole number of admissions; and the considered curable, with the whole number at the hospitals? In view of their apparently constant character, I think it should be allowed. It may be urged that the number of incurable insane permanently resident at our hospitals invalidates any calculation from which they are not eliminated; but, on the other hand, it may be judged from the constant character of the statistics I have already given, that this number is also constant; and, besides, who has ever given us a standard by which to judge, or by which he has judged, of the incurability of insane women?

From the evidence given, it would appear that while some 44 per cent. of the women entering our hospitals are annually discharged as recovered, but 16 per cent. of the women at these hospitals were considered by the competent authority whom I have quoted, as at that time subjects of probable cure.

It is possible, however, that Dr. Jarvis intended the word curability as synonymous with capability of recovery. What is this capability of recovery of insane women?

[1] Report on Insanity and Idiocy in Massachusetts, 1855. House Doc. No. 144, p. 78.

[2] Ibid.

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In women, as in men, it has been seen that of all admitted to asylums, nearly one-half are discharged well or much improved. A very marked difference, however, will be found to exist between the sexes if we compare the age, not of the patients, but of their disease.

At the French asylums, it has been observed that for the first six months of asylum treatment, the recoveries of males exceed those of females, while for the next six months, on the contrary, the proportion is much greater for females than for males.[1] Dr. Tuke has given, from the statistics of the York Retreat, a table that throws much light upon this subject. Like one of those that I have already presented, it is computed from a period of sixty-one years.[2]

Duration of disorder when admitted.	Proportion of Recoveries. Men.	Women.
First attack, and within three months . . .	72.97	73.23
" from three to twelve months . .	43.07	44.20
Not " and within twelve months . . .	59.44	67.01
First or not, and more than twelve months . .	13.29	22.59

From the above, it appears that in the first of the classes named, the excess of recoveries in women was .26 per cent.; in the second class, 1.13 per cent.; in the third class, 7.57 per cent.; and in the fourth class, 9.30 per cent.

From sheets of the First Annual Report of the Massachusetts Board of State Charities, that were kindly afforded me in advance of publication, by the Secretary, F. B. Sanborn, Esq., I was enabled to establish a computation to somewhat the same effect; namely, that while in acute and sudden, or explosive attacks of insanity, the percentages of recoveries in the sexes are at present nearly identical, in chronic cases there is quite a balance in favor of the women. Thus at the Worcester Hospital, during the thirty-two years of its existence, there have been—

Standing of Disease.	Discharged Recovered. Males.	Females.	Per centage to Admission. Males.	Females.
1 year or less,	1242	1372	.55	.54
1 to 2 years, numbers not corresponding with each other as reported.[3]				
2 to 5 "	112	124	.22	.24
5 to 10 "	42	53	.15	.20
10 to 15 "	12	20	.8	.13
15 to 20 "	9	9	.13	.21
20 to 25 "	7	6	.14	.18

[1] Legoyt, loc. cit., p. 426.

[2] Loc. cit., 261.

[3] First Annual Report of the Massachusetts Board of State Charities, p. 106. In the printed tables, from which I have deduced these computations, there is given as discharged, recovered, not recovered, or dead, of the class referred to above, a total of 458 patients, male and female, out of only 227 admissions.

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Beyond the limit last named, recoveries practically cease. It appears then, that in the first of these periods the proportions of recovery between the two sexes was almost identical; in the second and third, there was an excess of 2 per cent. in favor of the women; in the fourth, of 5 per cent.; in the fifth, of 5 per cent.; in the sixth, of 8 per cent.; and in the last, of 4 per cent.

It is very much to be regretted that the tables, calculated in the Report of the Board of State Charities, which I have just quoted, drawn from the statistics of the Taunton Hospital, do not contain a statement of the relative numbers of the two sexes discharged as recovered, and of the relative numbers of admissions in the several periods stated, as I should thus have been able to have compared the statistics of the two hospitals more closely, and then by combining them have procured a much larger, and therefore much more reliable basis.[1]

Again, the relative mortality of the two sexes at asylums is very different, or, as it has been expressed by the director of an asylum, "the dangers and discomforts attending a residence in an insane asylum have a much less effect upon females than upon males." Thus the smallest proportion of male deaths, reported at the French hospitals, during the twelve years whose statistics we have examined, was 15 per cent., while of females the minimum mortality was but 12 per cent.[2]

The average mortality during the whole of this period was, in males, 54 per cent., and in females, 45 per cent.; the whole number

[1] With reference to this discrepancy, to which I have above adverted, Mr. Sanborn writes me as follows: "The number *discharged* recovered, after an insanity of from one to two years, would naturally be greater than the number *admitted* with insanity of the same duration; since of those admitted with insanity of less than one year's duration, a great many are not discharged until their malady has continued beyond a year.

"With regard to the want of uniformity in the tables referred to, you must remember that I have not attempted to go beyond the tables given by each superintendent; that would involve an amount of labor which you can, doubtless, appreciate, but which it has not been in the power of this department hitherto to perform. It is to be regretted that the superintendents do not agree upon a form of statistical record which will admit of perfect comparisons."

[2] Amer. Journ. of Insanity, April, 1861, p. 433. Dr. Barstow copies Legoyt's error of considering that these figures show an advantage for the women of 39 per cent. I have, however, detected the source of this fallacy in the punctuating of the decimals. Instead of .39 the calculation should have showed .039, or between 3 and 4 per cent.; which corresponds with the percentage I have given above. This decimal would, it is true, show an excess of 39 in every thousand, but not in every hundred.

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of deaths being over 32,000, of which 17,390 were males, and 14,709 were females. We have here an average deficit in favor of the females, of 9 per cent.

"How is this diversity to be explained? May it not be that woman, whose occupations are essentially sedentary and whose habits more quiet, can accommodate herself better than man to the uniform system and routine of an asylum?"

"This supposition," continues the thoughtful writer from whom I have derived many of the figures upon which I have reasoned, "is to a certain extent justified by the small number of women who die during the first months of their admission."

Is it not more reasonable, on the other hand, in view of correlative evidence, to attribute these differences to a cause inherent in the fact of sex itself? These differences in mortality, it may moreover be shown, depend not merely upon varying material and economical appliances for treatment, and the varying grades of society from which patients are furnished, but they are constant. To prove this let us compare several well-known special hospitals for either sex.

At the Bicêtre, which is exclusively for men, the mortality, during the nine years from 1844 to 1852, was 263 per 1000. At the St. Lazare, which is also only for men, it was during the same period 302 per 1000; while at the Salpétrière, which is exclusively for women, the mortality during the same period was only 177 per 1000.

At the Worcester Asylum, during its thirty-two years, there were admitted 3503 males and 3601 females, and died 426 males and 419 females; in each instance about 11 per cent. of the total admissions. From this, we should at first sight surmise that the mortality of the insane was with us very much lower than it is abroad, did we not compare also the relative proportion of supposed recoveries in the two localities. If, as we have proved, these proportions do not materially vary, we have reason to suppose, if the history of our cases were carefully followed, that their mortality would not materially vary also. It is in questions like these, and more especially in those pertaining to the causation of insanity, as I may show at another time, that statistics become so unreliable. In simple inquiries like those at the commencement of this discussion, a comparison of alleged recoveries with the number of alleged admissions for instance, there is less opportunity for error, though even here, as will soon be seen, there is abundant cause for doubt;

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the more complicated the question becomes, the more unreliable the result from statistics. As these have been called for, however, I desired that they should not be withheld.

In this connection, I may be pardoned for presenting some very pertinent remarks upon the subject, from an authority whose loss is yet fresh to us in Massachusetts.

At the 10th annual meeting of the Association of Medical Superintendents of American Institutions for the Insane, held at Boston in May, 1855, Dr. Bell observed that "he had seen no reason to change the views urged by him so many years ago in reference to the worthlessness and inexpediency of attempting to present the facts of our hospitals for the insane in a numerical form. For many years he had protested against it, both as producing unjust inferences as to different institutions, and untrue expectations in the public mind. He had labored to effect a change in this matter, and, he believed, not without success. In fact, he had rendered himself somewhat notorious at one time, he feared, by his annual diatribe against the existing system of reporting. When visiting the most excellent institution at York in England, 'Art thou the Luther V. Bell who has written so severely about the statistics of the insane?' was the salutation which preceded every attention and kindness which the distinguished host could give his visitor. The difficulties he feared were in the very nature of the subject. One would think that the fact of a patient being dead for instance, was as specific, unconfoundable a basis, for a statistical return as could be conceived of, yet he would engage to make his returns of dead vary fifty per cent. without one deviation from truth. A simple suggestion to friends, that it might be more agreeable to them that the last days of a failing patient should be spent in the bosom of his family, would very frequently decide whether a case of death should be on the annual return."[1]

At a subsequent meeting of the Association, Dr. Tyler, Dr. Bell's equally eminent successor at the McLean Asylum, took occasion to state that, though statistics might not lie, "still we know that the mortals that make figures sometimes do."[2] Without in any way implying, or, indeed, believing that this view of Dr. Tyler's is especially applicable to the point we are now considering, for the statistics that I have given were undoubtedly published in per-

[1] American Journal of Insanity, xii. p. 99.
[2] Ibid., July, 1862, p. 44.

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fectly good faith by their collators, I may yet call attention to the peculiar force, in the present connection, of the last remark of Dr. Bell.

Similar comments are as applicable to the reports afforded of death details. "I do not see," says Dr. Ray, "how we can put forth as facts, of any statistical importance, the apparent causes of death. It is the custom to publish in the reports of the institution the cause of death. Now everybody knows that in many cases this must be a matter of guess-work. I should have far less confidence in the guess of any man in regard to the cause of death in an insane person, than in one not insane."[1]

To return to the discussion. We may then justly consider from the evidence that has been afforded, that "in those establishments which are devoted exclusively to females, the mortality, other things being equal, should be found less than in those devoted exclusively to males; the probabilities of death being, as we have already seen, greater among the latter."[2]

This fact is corroborated by Dr. Lockhart Robertson, Superintendent of the Sussex Asylum, who says that "the mean annual mortality of the male sex among the insane exceeds that of the female by about 35 per cent., while among the general population the male mortality only exceeds the female by 8 per cent."[3] This last excess, it will be perceived, corresponds almost exactly with the normal rate of disproportion in the sexes, which, estimated by Quetelet as averaging 106 male births alive to 100 females, in Europe, has been shown by Dr. Emerson, of Philadelphia, in his excellent paper, formerly presented to this Association, to vary in this country from 107 to 110 males to the 100 females.[4]

There is also a difference in the progressive mortality of the two sexes, according to age. Thus from a tabular exposition of the ages at which 3303 patients deceased in the French asylums, of whom 1755 were males and 1548 females, it appears that of females at insane hospitals dying under fourteen years, there are 92 per cent. as many as men.

[1] American Journal of Insanity, July, 1862, vol. xii. p. 38.

[2] Legoyt, loc. cit., p. 437.

[3] Notes on the Prognosis in Mental Disease, Asylum Journal of Mental Science, January, 1859, p. 287.

[4] Transactions of American Medical Association, vol. iii. p. 93.

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From 14 to 20 years	57 per cent.
" 20 " 25 "	63 "
" 25 " 30 "	73 "
" 30 " 35 "	64 "
" 35 " 40 "	65 "
" 40 " 50 "	60 "
" 50 " 60 "	90 "

These differences are attributed by Legoyt to "the greater vitality" of the female sex. With reference to the same point, evidence concerning the relative vitality of patients considered incurable, is not irrelevant.

The following table is given by Dr. Jarvis, as the probable duration of life in irrecoverably insane persons. It is based upon a calculation of the expectation of life in the insane, made by the actuary of an English Life Assurance Company:—[1]

Age.	Males.	Females.
20	21.31 years to live.	28.66 years to live.
30	20.64 "	26.33 "
40	17.65 "	21.53 "
50	13.53 "	17.67 "
60	11.91 "	12.51 "
70	9.15 "	8.87 "

Or, in other words, the insane woman at twenty, supposed incurable, has 1.31 per cent. as many years to live as the insane man.

At 30	1.23 per cent.
" 40	1.07 "
" 50	1.30 "
" 60	1.05 "
" 70	.88 "

From these facts it appears, and, as will have been seen, is acknowledged by competent authority, that

1. The relative mortality of insane women is less than of insane men;

2. Their expectation of life, even when supposed incurable, is greater; and

3. Their percentage of recoveries, even when the mental disturbance has become chronic, is also in excess.

But how does this evidence affect the question as to whether the recoveries of women at asylums are cures?

In several ways.

In both sexes, many patients are sooner or later re-admitted to

[1] Appendix to Report to Leg. of Mass., 1855, p. 192.

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the hospital, their disease proving to have been merely palliated, not cured.

The remedial discipline to which the two sexes are subjected at asylums is almost identical. It is chiefly that which is called moral; the medical treatment in almost every instance being of a strictly general character. We are, therefore, compelled to one of two alternatives, not that more women recover at asylums than men, for this is beyond what has been claimed, or what statistics prove, but that either a certain larger proportion of insane women do not die at hospitals than men, and do recover from chronic insanity under the same general treatment, which is shown by statistical evidence, and which must arise from some primal difference in causation; or else that the character of their insanity is different, and this also implies a difference of cause, not of moral and exciting causes merely, for these on the great scale and in different countries will be found to be nearly the same, the excesses in the one instance counterbalancing all deficiencies in another, but of an intrinsic and physical character, probably sexual.

Now it will be found that those writers who deny the existence of a different physical causation in the two sexes, are no better prepared to accept the other horn of this dilemma, for it will be found that a different result from the same general treatment implies a difference in disease; and a difference in disease arising from the excitement of similar stimuli, implies a difference in predisposition, and, therefore, in ultimate causation.

The only escape from these conclusions, is by denying my premises as to the character and identity of the medical treatment resorted to for the two sexes. Upon this point, however, though I have already furnished sufficient evidence, I will add still more.

Again, most writers on insanity acknowledge a frequent influence of the catamenia and of the catamenial molimen in reference to the exacerbation of the mental disturbance; this to a certain extent, putting aside the question as to whether or no the insanity in any of these cases springs from an uterine origin. To the extent now stated, few will deny the fact, for an immense body of proof has been incidentally published in psychological text-books, monographs, and periodicals, and can be readily adduced. In many of these cases, the menses when absent have *accidentally* appeared without any direct aid from medical treatment, and the patient has immediately and in consequence recovered. Such cases are not spoken of as uncommon. They undoubtedly frequently occur.

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Many instances are also on record, where insanity has suddenly ceased on the woman's passing the grand climacteric, at the permanent and final cessation of the catamenia. It could hardly be alleged that these were cases of *cure*. They also, there is good reason to believe, are not uncommon.

It will be seen that I here purposely avoid referring to other than published and acknowledged evidence furnished by the directors of asylums, for almost every work as yet issued upon the subject of insanity has been from such a source.

There is one other point to which, in this connection, I may be permitted to refer, and that, the comparative infrequency in women of one of the most common and most fatal of the forms of insanity. I refer to the so-called paralysis of the insane, the paralysie générale of the usual and artificial classification.

This disease, one of the few mental disorders that is attended by organic lesion of the brain or spinal cord, is comparatively unknown in women. This fact has been acknowledged by Dr. Robertson, of the Sussex Asylum,[1] by Drs. Workman and Choate[2] in this country, and by many other competent authorities. "We know positively," says Morel, "that the number of the paralytic insane is infinitely greater among men than among women."[3]

In a table furnished by the author now quoted, it appears that of 800 insane women at the asylum of St. Yon, there were 25 afflicted with this disease, or 3 per cent.; while at the asylum of Quatre Mares, devoted exclusively to males, there were of 500 inmates no less than 100, or 20 per cent., affected with general paralysis.

The above statements agree with those previously made by Esquirol.

"Paralysis," says this writer, "is more frequent among insane men than women. Eighteen years ago, when charged with the service of the division of the insane at the Bicêtre, during the absence of M. Pariset, who was sent to Cadiz to study the yellow fever which was prevailing there, I was struck, in comparing the number of men, insane and paralytic, at the Bicêtre, and the number of paralytic women at the Salpêtrière. The same observation may be made in every establishment into which both sexes are admitted. It has not escaped the notice of Dr. Foville, physician-in-chief at St. Yon. According to this physician, they amount to one-eleventh

[1] Asylum Journal of Mental Science, Jan. 1859, p. 276.
[2] American Journal of Insanity, 1860.
[3] Traité des Maladies Mentales, p. 813.

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at the institution over which he presides. Among 334 insane persons who were examined by him, 31 were paralytic, to wit, 22 men and 9 women. At Charenton, the proportion of paralytics is still more considerable. They constitute one-sixth of the whole number of admissions. In truth, of 619 insane persons who were admitted during the three years 1826, 1827, and 1828, 109 were paralytics. But the proportion of men is enormous compared with that of women. Of 366 insane men admitted into the house, 95 were paralytics; while of 153 women, 14 only were affected with paralysis. This complication is most frequently observed among that class of insane persons who have yielded to venereal excesses, or have been addicted to the use of alcoholic drinks; among those, also, who have made an inordinate use of mercury, as well as those who, exercising the brain too vigorously in mental strife, have, at the same time abandoned themselves to errors of regimen. Do not these circumstances explain sufficiently well, how it happens that there are more men insane and paralytic than women?"[1]

The few cases of women who are affected by general paralysis are chiefly prostitutes,[2] so that in the ordinary classes of society, it is among women practically absent. The fact to which I have referred is one that is now generally acknowledged. In a discussion upon the subject at Philadelphia in 1860, it was fully admitted by Drs. Workman of Toronto, Bancroft of the N. H. State Asylum, Athon of that of Indiana, and Harlow of that of Maine.[3]

The same comparative immunity for women has also been noted in the form of insanity now known as congestive mania, and so thoroughly described by my colleague, Dr. Worthington, of the Friends' Asylum at Frankford, Pa.[4]

We may, from the evidence that has now been offered, fairly conclude, that (1) while some at least of the women discharged from asylums as recovered, are not in reality cases of cure, (2) there are others not reported as having recovered, who yet ought, if we may believe the evidence of statistics, to have done so. If the mortality in insane women is less than in men, and if the most frequent of the incurable mental diseases in men is absent in women, a larger percentage of them should recover than of men, unless they have some corresponding fatal disease which is absent in men. The existence however of such a disease has never been acknowledged.

[1] Esquirol, loc. cit., p. 438. [2] Morel: Traité des Mal. Mentales, p. 828.
[3] American Journal of Insanity, July, 1860, p. 65.
[4] Ibid., p. 64.—Oct. 1850, p. 114.

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If the facts above proved are admitted, it would scarcely seem (3) that all justifiable resources of medical treatment can have been put in requisition at asylums.

I have alluded, in connection with the last point now referred to, to the admissions of gentlemen having asylums in charge. In a former communication upon this subject, I stated why it was that, as asylums are now constituted, the whole duty of a physician by his patient, if a woman, could not be performed.[1] The evidence was such as was thought conclusive by this Association at its late meeting, in New York. That there might be no room for cavil, I fortified my arguments by a frank and forcible letter from Dr. Butler, of the Hartford Retreat.[2] The force of this letter was subsequently sought to be weakened, by the assertion "that it was only conclusive of the lack of a disposition on the part of its writer, to make use of all the means of treatment considered proper to aid in restoring a patient."[3] That the position of Dr. Butler, as described by himself, is a very common one, I have good reason to believe, and as it arises from causes over which superintendents have had no control, I have not been so unjust as to throw any blame upon them, as their own official brother seems to have done in the communication to which I have referred.

The same charge of incompetence, implied if not directly made, against these gentlemen, has come to me from another quarter of their own precincts. Under date of 11th Jan. 1865, Dr. Gray of the N. Y. State Lunatic Asylum at Utica, writes me as follows:—

"Of the applicability of some of your strictures to some asylum superintendents,[4] it is not for me to judge. I however contend that they do not apply to all, any more than would a sweeping charge of ignorance against the medical faculty of Harvard, on account of the incapacity of some of your professional brethren."

I can only say, in reference to this point, that the only instances in which evidence has been furnished me that what is generally styled special treatment for the diseases peculiar to women, such as is now constantly resorted to, and generally considered proper and necessary, in civil practice, has ever been employed at any of our insane asylums, save at the Butler Hospital, at Providence, and

[1] Bost. Med. and Surg. Journal, Oct. 1864, p. 211.

[2] Ibid., p. 214.

[3] Ibid., Nov. 1864, p. 290.

[4] It will have been noticed by those familiar with my former papers, that my strictures were upon no asylum superintendents, but upon the circumstances which prevent their performing their whole duty by their patients.

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at the McLean Asylum in consultation, have been at the Friends' Hospital, at Frankford, Pa., and at the Michigan State Asylum, at Kalamazoo, respectively under the charge of my colleagues, Drs. Worthington and Van Deusen. I may in this matter do great injustice to the zeal of those eminent in this specialty, and to their moral courage, for this is needed in instituting what I have proved to be a radical change in treatment, but, as I have made minute inquiries, and have now heard from many of the gentlemen referred to, it is hardly possible.

In the case of the Utica Asylum, from which one of the implications alluded to has come, I can only say that this is one of quite a number of asylums that I have had opportunity, officially, carefully to examine; that my visit to it was in September, 1863; that in the absence of Dr. Gray, the superintendent, I was most courteously received by his very intelligent assistant physicians, who freely and fully informed me concerning all points that I raised, which were chiefly with reference to the medical treatment of the female patients; that from what I was told, I have no reason to suppose that special treatment was thought necessary at that asylum for the so common special diseases of women, whether occurring as cause of the insanity, or its concomitant; and that I had very good reason, on the contrary, to believe that such was seldom or never resorted to at the present time.[1] If, however, I was mistaken in my impression—and I shall be most happy to learn that I was in error—then it will follow that Dr. Gray himself, and all gentlemen who are sufficiently enlightened to engage in the investigations for which I am contending, and which, from the language I have quoted, he would seem to approve, it will follow that they all, equally with myself, fall under the ban laid in the Boston Journal for 5th Jan. ult., upon every one of us who would cure in insane women, their so-called "imaginary" physical disease;[2] as supposed to be present, not by them, but by ourselves.

I have said that my remarks do not apply to our own asylums alone, nor have I desired that they should seem to do so. The

[1] Yet in the report of the New York State Asylum for 1852, by Dr. Gray, it appears that in nearly one-fourth of all the cases of insanity reported, the disturbance of the generative organs was so marked as to be regarded as a *primary* cause of the mental derangement. (*Amer. Journal of Insanity*, xii. p. 306.) In the report of the same institution ten years later, for 1862, only a tenth of the women are thus reported, unless the 43 cases stated as caused by previous ill-health are to be considered of this character, in which event, the proportion would rise to nearly one-half.

[2] Loc. cit., pp. 452 and 453.

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similarity as to percentages of recoveries, etc. etc., between our own and foreign asylums, goes to prove what I have attempted to show by other evidence, that nowhere, at home or abroad, has the difference of causation which, I believe, exists in many instances between the two sexes as to mental disease, been generally appreciated or acted upon. The view to which I refer explains the problems elicited by the statistics I have now presented; they, on the other hand, are wholly inexplicable, save by this simple key. I may be told over and over again that my view is an old one. If appreciated in all its bearings, why then has it not been accepted? That it has been so in the present, or in former times, I can find no evidence.

The disturbance which my deductions seem to have caused in certain minds, would seem to imply, as I have indeed been told, that there was a chance that these inquiries, if pushed, would result in injury to the present unimpeded system of hospital management. Nothing, however, as I have already asserted in almost every paper I have written upon the subject, is further from my own intention. The researches have been undertaken simply and solely for a scientific purpose, and the papers I have now presented may serve as earnest that the investigations will be pushed to their legitimate result, it is almost unnecessary to state, without either fear or favor.[1]

It was lately publicly intimated, that for one of the measures I have advocated, merely one item in the system of public and private treatment that is required for insane women, the establishment of an Advisory Medical Board at asylums,[2] there can be

[1] It has been implied, and I have been told, that a controversy which has occurred upon this subject, unsought by myself, had become too personal. Of this I am well aware. I was grossly attacked by an anonymous assailant, of whose identity I am, even to this day, ignorant, except by inference. It would now seem time for that writer, as he has claimed in his second article (*Boston Med. and Surg. Journal*, Jan. 1865, p. 453) to represent the views of a large circle in his specialty, to drop the mask and enter the arena in his proper person, if, indeed, he be a man, and not a celestial myth, as his sign manual, a star, might perhaps have been held to imply. I can hardly suppose my antagonist, if he be in reality what he claims for himself, and not, as has been suggested to me, a mere assistant physician, who has perjured himself by falsely asserting that he has been a superintendent—a jackdaw assuming the plumage of an eagle—pursuing longer a different course, if he have really at heart the cause of truth, and the honor of our profession.

[2] Trans. Amer. Med. Association, 1864. With regard to the suggestion now referred to, I would frankly state that my colleagues, Drs. Van Deusen and Worthington, like some others of the fraternity who have erroneously seen in the

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found no one of any note among superintendents to approve. I will not weary my readers by carrying my evidence from statistics to any greater extent than I have already done, though I am well prepared even upon this point. I will, therefore, simply append the following letter, which was unsolicited, from Dr. Isaac Ray:—

"BUTLER HOSPITAL, Nov. 26, 1864.

"MY DEAR SIR: I have read your pamphlet with much interest, especially your remarks on the employment of Boards of Consulting Physicians in asylums for the insane. Your views strike me to be eminently just, and I am glad you have called public attention to the subject. The case, in fact, hardly admits of argument. What medical man now needs be persuaded that in a hospital of at least one hundred patients, for any disease, there must be occasions, more or less, when the single doctor in charge would or should gladly consult another physician? And if so, it is far better that he should resort to an established Board, made expressly for his benefit, ready to come gratuitously, than to some eminent man who expects and is justly entitled to a liberal compensation. To such a Board as I refer, the honor of the position would always be considered sufficient compensation for so light a duty.

"Your paper seems to be but part of a larger one, which, if published, I have not been so fortunate as to meet. Unquestionably, abnormal conditions of the sexual organs have often a very large influence in the development of insanity in women. I presume, however, my observations would hardly warrant me in attributing so much to them as, I suppose, from one or two expressions, you do.

"I admit that we asylum physicians cannot, necessarily, obtain that accuracy of diagnosis which is comparatively easy to other men; but the existence of sexual disorder of some kind need not be overlooked by any one who looks at all, provided it is sufficiently grave to affect the brain.[1] Not that I consider these affec-

advisory board an end rather than a means, are disinclined to indorse it; basing their objections, so far as communicated to me, upon the trite ground that any assistance would be rather an interference with the superintendents. The former of the gentlemen, however, admits that "the subject of the appointment of a consulting physician and surgeon, *with special* reference to the examination and surgical treatment of female patients requiring it, is new" to him; and it is allowed by the latter that "there might be cases, here and there, that would (thus) be helped."

[1] Dr. Ray seems here hardly to appreciate the nice discriminations, so often productive of success in treatment, now made in the diagnosis, direct and differential, of obstetric disease.

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tions as of little consequence, and unworthy, when present, of being accurately understood and properly treated, for I am well aware that mental disease may sometimes be continued indefinitely by the persistent influence of sexual organic disorder.

"We had here this summer a death in the earlier stage of mania, where the disease seemed to have been mainly excited by some venereal excrescences in the vagina, and we have now in the house a lady whose disease was unquestionably produced, as it is now kept up, by an 'irritable uterus.'

"I repeat that I am glad you have called attention to this point, because, in the treatment of insanity, we are too apt to overlook or undervalue all collateral, subordinate conditions.

"Yours, very respectfully,

"Dr. H. R. Storer." "I. RAY.

I have thus, very imperfectly as I am aware, presented a portion of my views as to the causation and treatment of a large proportion of the cases of insanity occurring in women. I have furnished evidence, in confirmation of these views, from many of the leading psychological experts of the present day. I have shown that my deductions are such as *à priori* ought to have resulted, and such as alone can explain admitted facts. I have proved that these views are not generally entertained by the specialty devoted to the insane, or if entertained, are not generally acted upon in practice. I have confined myself in the main to the general question of causation, for the present, omitting the discussion of minor but scarcely less important questions and details; upon all of which I have now a mass of evidence, that I shall hereafter most gladly adduce. I have refrained, save in what pertains to pregnancy, from using the testimony of gynæcologists, and of the profession at large, strongly corroborative as this would have been of my every position, preferring to meet the objections that have been made, by answers from a similar source. I have attempted to avoid all resort, or appearance of resort, to any special pleading, though such is apparent enough in these objections; that, for instance, a gynæcologist must necessarily be a practitioner of but one idea, and therefore incompetent—the truth being, that without at least one fundamental idea, no man should be deemed fit for the charge of any sick women, whether insane or in their right mind.

I have endeavored to deal fairly with gentlemen whose opinions, from a previous bias of perhaps many years' standing, may clash

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with my own, and have acknowledged my belief that, in most of the quarters of this important sphere, they have left little unaccomplished that was practicable for the good of their patients. I have striven sedulously to avoid expressions or a tone that could possibly create undue offence—though not, I conceive, upon all occasions, myself treated as fairly. With reference to certain of the arguments with which I have been met, I might well have said, as did Blundell in answering the current criticisms upon ovariotomy, for our cases are in many respects very parallel: "These men are butting their heads against a stone wall; and the grimaces they make, on feeling the solidity of the materials, are as amusing as they are pitiable." Had I not, at this time at least, decided to fortify my plea by evidence that had been afforded solely by psychologists, I might have adduced more trenchant commentaries than I have done, even indeed from the authorities I have made use of.

But, on the other hand, it is an obstetrical rule that where there is a choice of measures, the harshest is always to be chosen the last. It is as true of the birth of a principle or of a method of practice, as of a child. In surgery, no incision is to be made longer or deeper than the occasion requires. Sincerely believing, as I do, that the only rational treatment of insane women must be based upon the same general medical and surgical principles as those that control the management of every other conceivable form of disease, I could say no less than I have done.[1] To the profession I leave the decision of the questions involved.

[1] A week subsequently to the meeting of the Association at which the above report was presented, I attended, as its delegate, the Annual Meeting at Pittsburg of the Association of American Superintendents, with instructions to urge upon these gentlemen the propriety, for the purposes of science and of effectual practice, of a more intimate union upon their part with our own body, representing as this does the profession at large. The cordiality with which I was received by the large circle of Superintendents then present, the majority of them till then strangers to me and the respectful attention with which my views so far as I presented them were met, have but served to confirm me in the opinion that those who have so ungraciously endeavored to stifle this discussion do not represent the main body of American psychologists, and that the seeds of a more rational practice, now to be scattered by the aid of the press, will not fall upon wholly unfruitful soil.

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REPORT OF THE SECTION

ON

Medical Jurisprudence and Hygiene.

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REPORT OF THE SECTION

ON

MEDICAL JURISPRUDENCE AND HYGIENE.

JUNE 6th, 1865.

THE Section met at 3 o'clock P.M., and organized by calling Dr. JAS. F. HIBBERD, of Indiana, to the Chair, and appointing Dr. ROBERT BURNS, of Pennsylvania, Secretary.

Dr. BOWDITCH, of Massachusetts, read a portion of a letter received by him from the Medical Director of the United States Army, at Savannah, Georgia, setting forth that such had been the devastation of the country by the Army of General Sherman, in the line of its march through Georgia and South Carolina, that not only was the present supply of food exhausted, but the implements and animals necessary to raise more were carried off or destroyed, and, therefore, without some assistance from the people of the North, the autumn and winter must bring with them famine and pestilence to the inhabitants of that desolated district.

After some consultation, Drs. BOWDITCH, of Massachusetts, NEBINGER, of Pennsylvania, and HUNT, of New Jersey, were appointed a Committee to inquire into the extent of this threatened calamity, and report what action should be taken by this Section.

The Report of *The Committee on Vaccination and Revaccination for the Eradication of Smallpox*, was taken up, read, slightly altered, and recommended for publication: and it was farther recommended that the Committee be continued.

Dr. NEBINGER, of Pennsylvania, read a paper on *The Compensative Nutritive Treatment of Smallpox*, which was discussed by Drs. BOWDITCH, HUNT, BULKLEY, ATKINSON, and NEBINGER, and recommitted to the author, with liberty to condense it, and then hand it to the Permanent Secretary indorsed for publication.

Adjourned.

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JUNE 7th, 1865.

Section met at 3 P. M. Officers present.

Dr. TONER, of the District of Columbia, read a paper on *Compulsory Vaccination*, which was discussed with interest and animation by Drs. BOWDITCH, BIBBINS, TWITCHELL, NEBINGER, BULKLEY, and HIBBERD.

Dr. BIBBINS, of New York, related a case in his practice where the eruption of smallpox appeared in a child four days after vaccination, the two diseases progressing *pari passu*. At the proper time lymph was taken from the vaccine vesicle and inserted in the arm of other children, producing pure vaccinia and nothing else; the child died on the thirteenth day of smallpox.

Dr. Toner's paper was then recommitted to its author, with permission to condense it, and hand it to the Permanent Secretary indorsed for publication.

Dr. BOWDITCH, from the Committee appointed yesterday, reported that upon inquiry of other medical gentlemen who had been in Georgia and South Carolina, the Committee deemed it best to make no recommendation to the section, for want of definite information.

A Report on *The Introduction of Disease by Commerce, and the Means of its Prevention*, by A. N. BELL, M. D., of Connecticut, was considered, and indorsed for publication.

Dr. GREEN, of Massachusetts, read a letter from THOS. F. AZPELL, U. S. V., asking the Association to urge the importance and propriety of the U. S. Army Medical Bureau sending a commission to Europe and the East, to inquire into the origin of epidemics, and the nature of the countries where they originate.

After deliberation, the communication was laid on the table.

Some other papers were referred by the Association to this Section, but, as they were neither left at the Secretary's table nor presented to the Section, they could not be acted on.

The following subjects were selected to be reported on at the next annual meeting, and the Committees attached appointed to take charge of them.

Comparative Value of Life in City and Country.—Dr. EDWARD JARVIS, of Massachusetts, Dr. J. H. GRISCOM, of New York, and Dr. E. M. SNOW, of Rhode Island.

Drainage and Sewerage of Cities in their Influence on Health.—Dr. WILSON JEWELL, of Pennsylvania, Dr. CYRUS RAMSAY, of New York, and Dr. JOSIAH CURTIS, of Massachusetts.

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What Effect has Civilization on the Duration of Human Life.—Dr. A. A. GOULD, of Massachusetts, Dr. W. F. PECK, of Iowa, and Dr. Z. PITCHER, of Michigan.

On Disinfectants.—Dr. E. M. HUNT, of New Jersey, and Drs. A. N. BELL and J. C. SMITH, of New York.

Central Committee on Vaccination (continued).—Drs. A. N. BELL, J. P. LOINES, and H. D. BULKLEY, of New York, Dr. A. NEBINGER, of Pennsylvania, and Dr. J. F. HIBBERD, of Indiana.

On motion adjourned.

R. BURNS, Secretary.

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REPORT

OF THE

COMMITTEE ON THE VALUE AND NECESSITY OF VACCINATION AND REVACCINATION

FOR THE

ERADICATION OF SMALLPOX.

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PROTECTION FROM SMALLPOX BY MEANS OF VACCINATION AND REVACCINATION.

YOUR Committee report progress. As soon as practicable, they prepared the following paper:—

"At the annual session of the American Medical Association held in New York, June, 1864, the following resolutions were adopted, and the undersigned appointed a Committee to carry them out:—

'*Resolved*, That the Association deems it a duty to institute measures looking to the vaccination, ultimately, of every person living in the limits of country over which it exercises influence.

'*Resolved*, That a Central Committee of five be appointed to enlighten the public mind, by all available means, upon the value and necessity of universal vaccination.

'*Resolved*, That the Central Committee be authorized to appoint associate and auxiliary committees in each State.'

"According to the most reliable statistics obtainable, the annual death-rate of the United States is about one in forty-five of the whole population, or about 600,000 annually for the last ten years. Of this number of deaths from all causes, about one in every two hundred and fifty, or, in round numbers, not less than 2,500, die annually of smallpox. This mortality, estimated by the usual ratio of deaths in smallpox, demonstrates the existence of more than 10,000 cases of unmodified smallpox annually in the United States, exclusive of varioloid, all of which can be wholly prevented by effectual vaccination and revaccination. During the great epidemics of smallpox which prevailed in Europe during the early part of the present century, all observers had abundant opportunities for ascertaining the true value of vaccination. The vaccinated and those who had previously had smallpox were both found to be more or less subject to the disease. Early in the progress of these epidemics, however, an important fact became evident, namely, that there was a great difference in the mortality of smallpox when it

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attacked these three classes: 1. The vaccinated; 2. The variolated; and 3. Those who had neither been vaccinated nor had smallpox. Of the first class, those who had been previously vaccinated, out of every 330 attacked, only 1 died. Of the second class, those who had previously had smallpox, 1 out of every 50 died. While of the third class, those who had neither been vaccinated nor had smallpox, 1 out of every 4 died. Thus proving the great superiority of vaccination over smallpox itself in protecting the system from the fatality of a second attack.

"Unmodified smallpox is not only a very fatal disease, as proved by its frequently cutting off one-fourth of all whom it attacks, but its tendency is to develop any latent disease which may exist in the constitution, particularly scrofula, and it is thus indirectly the cause of death to a much larger portion of the human race than at first sight appears. It is not, therefore, surprising that smallpox, attacking for the second time an already enfeebled constitution, should cause a greater proportion of deaths than takes place when it occurs after vaccination, a much milder form of the same disease, and, therefore, proportionately less likely to develop any pre-existing constitutional affection.

"It may, indeed, be truly said that during the last sixty-four years, vaccination has not only prevented millions of cases of smallpox, but that it has also saved a multitude of persons from scrofula and other fatal maladies.

The human race has become stronger, has produced more hardy offspring, not only suffering less from disease in general, but in all respects more capable of resisting it, through the instrumentality of vaccination.

"Among the earliest objections urged against vaccination, even during the time of Jenner, was the alleged danger of communicating other diseases with the vaccinia. And from that day to this, cases of cutaneous disease, syphilis, scrofula, etc., have been occasionally attributed to this cause. But if it were now possible to collect all such cases, even then their utter insignificance when compared with the multitude that have unknowingly been vaccinated with lymph taken from diseased persons, without contamination, is such that this evidence alone against the transmissibility of other diseases by vaccination would be sufficient to establish the conclusion as a general rule, that *there is no danger of communicating other diseases with vaccinia.* This conclusion is in keeping with the recorded experience of Heim, Ricord, Bousquet, Taupin, Landoury, Friedin-

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ger, and many others who have investigated the subject, and may, indeed, be regarded as an accepted truth by the most distinguished men of the medical profession.

"The recorded facts, the arguments, and deductions made by investigators in reference to the possibility of transmitting other diseases with vaccinia, added to the facts, positive and negative, which have presented under our own observation, not only confirm our belief in the non-transmissibility of other diseases with the vaccinia *as a general law*, but demonstrate that vaccination, besides preventing smallpox, frequently fortifies the constitution of the individual against some of the worst of those very diseases which are erroneously alleged to be transmitted by it. We would not, however, be understood as approving of the use of vaccine virus obtained from diseased persons; but, on the contrary, *none should ever be used knowingly except that which has been obtained from perfectly healthy subjects.*

"The protective powers of vaccination are most evident in their results to mankind in general. The comparative exemption of all civilized communities, for the last forty years, from the most terrible scourge to which mankind was ever liable is an evidence of the protection afforded by vaccination so overwhelming as to characterize the discovery of Jenner as the greatest boon ever conferred upon the temporal welfare of man.

"In England alone, for nearly a century before the introduction of vaccination, no fewer than 30,000 persons were annually cut off by smallpox; which, in the same ratio, according to the present population, would be equivalent to 100,000 deaths annually. Out of every 1,000 deaths, from 1750 to 1800, there were by smallpox 96; from 1800 to 1850, there were, for the same number, but 35.

"In Germany, for the same periods of time, there were, out of every 1,000 deaths for the former period by smallpox, 66.5; for the latter period, 7.26.

"In Sweden, for the last twenty-eight years before the introduction of vaccination, out of each million of the population there were 2,050 deaths annually by smallpox; for forty years subsequent to the introduction of vaccination, the number of deaths annually by smallpox, per million of inhabitants, was 158.

"In Westphalia, from 1776 to 1780, the annual smallpox death-rate per million of inhabitants was 2,643; from 1816 to 1850, it was 114.

"In Copenhagen, 1751 to 1800, the annual rate per million was

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3,128; from 1800 to 1850, it was 286. In Berlin, for the same periods, the rates relatively were 3,442 and 176.

"American statistics, so far as known, are equally conclusive. According to a paper read by Dr. Robert Ware, before the Boston Sanitary Association, we learn that in Boston, in 1721, the year in which inoculation was introduced, and when the whole population was 11,000, 5,759, or more than one-half, had smallpox, and of these 844 died. In 1730 there were 4,000 cases and 200 deaths. In 1752, when the population was 15,684, there were 5,545 cases and 539 deaths. In 1764 there were 5,646 cases; in 1776, 5,292; and in 1792, 8,346. Compared with a subsequent period, after the general introduction of vaccination, and when it was in a measure compulsory, from 1815 to 1830, the mortality from smallpox was only *fourteen;* from 1811 to 1839, it was but *fifty-two.*

"By an approximate average death-rate by smallpox per million of living population, from 1750 to 1800, and from 1800 to 1850, in various countries (collected by the Epidemiological Society of London), there were, in the former period, nearly twenty times as many deaths by smallpox as there were in the latter. And besides, 'one obviously beneficial result of vaccination, as regards its protective influence on the multitude, has not, we think, been appreciated or illustrated with sufficient force, namely, that the epidemic influence of smallpox greatly increased during the practice of inoculation, and greatly decreased since vaccination has been adopted. Dr. Hebra, Professor of Diseases of the Skin at Vienna, incidentally remarks and simply alludes to the fact that 'epidemics of smallpox have been more rare and are less malignant since the introduction of vaccination.' But definite material for the following statements are to be found in the report of the Epidemiological Society in illustration of our remarks. 1. During 91 years previous to *inoculation* there were 65 distinct and well-marked epidemics, which is a ratio of 71.4 epidemics in 100 years. 2. During 63 years in which *inoculation* was practised, and that to a great extent, there were 53 distinct and well-marked epidemics, which is a ratio of 84 epidemics in 100 years. 3. During the last 50 years, in which vaccination has been practised, and inoculation been declared illegal, there have been 12 epidemics of smallpox, which is a ratio of 24 epidemics in 100 years."[1]

"According to the well-kept mortality statistics of Sweden, the

[1] Medico-Chir. Review, October, 1857.

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annual smallpox death-rate in that country during the period of 1841–50 averaged less than the *weekly* death-rate from smallpox and measles during the period of 1755–75. This important fact introduces us to an indirect benefit of vaccination, which has, until recently, been overlooked, namely, the beneficial influence of vaccination against other diseases. Drs. Greenhow and Farr, under the auspices of the General Board of Health of London, have shown that with the decline of smallpox consequent on vaccination, the general death-rate has greatly diminished from all causes; and that, too, notwithstanding a severe and fatal epidemic of influenza and two epidemics of cholera; and under this diminution, it is especially notable that the two classes of disease usually considered the most fatal, namely, scrofulous and low febrile affections, have diminished in a remarkable degree. The general death-rate per 10,000 of living population, during the periods of 1846–55, was twenty five per cent. less than the decennial period of 1746–55, and forty per cent. less than the decennial period of 1681–90, showing a successive decline since the remoter period from 421 to 355; and since the more recent period from 355 to 249.

"According to Dr. Farr's statistics, the average annual death-rates in London, from all causes and all ages, per 10,000 living, were:—

From 1771–1780	500
" 1801–1810	292
" 1831–1835 (smallpox prevailed)	320
" 1840–1854	248 9/16

"The average annual death-rates in Sweden, from all causes and all ages, per 10,000 living, were:—

From 1776–1795	268
" 1821–1840	233
" 1841–1850	205

"In McCulloch's *Descriptive and Statistical Account of the British Empire*, Dr. Farr has shown that fever has progressively subsided since 1771 (at first under the influence of inoculation); 'and that the *combined mortality of smallpox, measles, and scarlatina is now only half as great as the mortality formerly occasioned by smallpox alone.*'

"According to the researches of Dr. Greenhow, previous to the introduction of vaccination, the death-rate from scrofulous diseases was five times greater than it is at the present time; and the present death-rate of pulmonary consumption, great as it is, is seven per cent. lower than it was previous to the discovery of Jenner.

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"M. Bousquet,[1] in his detail of the epidemic which prevailed at Marseilles in 1825, states that the whole population was estimated at 40,000. Of these, 30,000 had been vaccinated, 2,000 had had smallpox, 8,000 had neither been vaccinated nor had smallpox. Of the 30,000 vaccinated, 2,000 were seized with smallpox; 20 of whom, or one for every hundred affected, died. Of the 2,000 who had before had smallpox, either naturally or by inoculation, 20 were attacked, and of these 4 died, or one for every five who took the disease. Of the 8,000 who had not been vaccinated nor had smallpox, 4,000 contracted it, and 1,000 died, or one in every four. By this it appears that *one-half* of the non-vaccinated, *one fifteenth* of the vaccinated, and *one one-hundredth* of the variolated took the disease. But such was the difference in the comparative mortality of the attack in the vaccinated and the variolated, that while the variolated part of the population were cut off in the proportion of *one* out of every 500, the vaccinated only lost *one* out of every 1,500; or, in other words, of an equal number of variolated and vaccinated cases, *three* of the variolated died from the second attack, for every *one* that died who had been previously vaccinated.

REVACCINATION.

"Several governments, confident in the anti-variolous power of vaccination, and profiting by the experience gained, determined upon revaccination as the most likely means of getting rid of the epidemics which were desolating their armies. The effect was so salutary as to have finally banished smallpox from among them. But this was not the only benefit. Knowing, as we do, that smallpox and cowpox are in reality the same disease, the latter being merely deprived of its virulence by having previously passed through the system of the cow, the results of these numerous revaccinations are of immense importance not only in confirming the identity of smallpox and cowpox, but in establishing the no less important fact that the protective power of smallpox itself wears out of the system in a certain proportion of cases, as life advances, in nearly the same ratio as that of cowpox. Thus, in all these armies a certain proportion of the men were found to have been previously vaccinated, while no inconsiderable proportion had passed through unmodified smallpox. Now, if we take the susceptibility to revaccination as a test of liability to varioloid or to a second attack of smallpox, we have these vaccinations proving

[1] Traité de la Vaccine.

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the fact that after a certain number of years the same proportion of those who have previously had smallpox become susceptible to a second attack, as those who have been vaccinated are to varioloid. So that once having passed through all the dangers of unmodified smallpox, the person, at the end of twenty years, for instance, has no better security against a second attack than the person who has been vaccinated for a corresponding length of time.

"In the Wurtemberg army, of 40,000 cases collected by Dr. Heim, on revaccination, it was found that in every 100 vaccinated after smallpox, 32 succeeded, 26 were modified, and 42 failed. In every 100 revaccinated, 34 succeeded, 25 were modified, and 41 failed.

"According to the Statistical Report of the Medical Department of the English Army, from Oct. 1858 to Dec. 1859, 32,510 soldiers and recruits were vaccinated. Of this number, 4,124 bore marks of unmodified smallpox, 23,924 bore good marks of vaccination, 1,901 bore doubtful marks of vaccination, and 2,561 had no marks of either vaccination or smallpox.

"By reducing these figures as nearly as possible to the same scale as those above given for the army of Wurtemberg, we find that of the 4,124 who had previously had smallpox, on vaccination, 1,473, or 35 per cent., succeeded; 799, or 19 per cent., took imperfectly; and 1,842, or 44 per cent., failed. Of the 23,924 who had good marks of vaccination, on revaccination, 8,976, or 37 per cent., took perfectly; 5,277, or 22 per cent., imperfectly; and 9,671, or 40 per cent., failed. Of the 1,901 with doubtful marks of vaccination, the number of good vesicles on revaccination was 777, or 40 per cent.; modified, 505, or 26 per cent.; and 616, or 32 per cent., failed. Of the 2,561 who had no evidence of protection, on vaccination, 1,362, or 53 per cent., took; 484, or 18 per cent., had modified vesicles; and 715, or 23 per cent., failed.

"In the Prussian Army, in 1860, 69,096 soldiers were vaccinated. Of this number 57,325 exhibited marks, more or less perfect, of previous vaccination, 7,420 being distinct; 4,151 showed no marks whatever. Of the whole number, 44,193 took; 8,256 partially and 16,047 failed. These last were vaccinated again, when 5,577 proved successful, and 11,650 failed. During the year, there occurred among those who had been unsuccessfully vaccinated, and others who had been successfully vaccinated, in former years, one case of varioloid, but no case of smallpox. Thus, during the year 1860, out of 69,096 vaccinations, 49,777, or 72 per cent., took. In the entire army, there occurred during the year, 23 cases of

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varioloid, and 4 of smallpox. Of these cases, 14 of varioloid and 4 of smallpox occurred in persons who had not been revaccinated; 8 of varioloid and 1 of smallpox occurred among those in whom the revaccination failed; and the remaining 1 of varioloid, among those who had been revaccinated with success.

"In the United States revaccination has received but little attention. On the breaking out of smallpox among a crew of five hundred persons, on board a U. S. frigate, about twenty-five years ago, the late Dr. Samuel Jackson, Surgeon U. S. N., vaccinated the whole ship's company. One in six took. They had all been vaccinated or had had smallpox before. Those on whom vaccination failed, proved to be equally insusceptible to smallpox, which wholly ceased from the time the revaccinations took effect.

"Of 686 recruits vaccinated by Dr. Forry, U. S. Army,[1] 560 had been vaccinated before, 74 had had smallpox, and 52 had not had smallpox nor been vaccinated. Of the 560 previously vaccinated, 381 exhibited good cicatrices; 134 imperfect, and 45 had no marks at all; 196 took, including 55 which were modified. Of these 196, 109 had been previously vaccinated before the age of five years; 48 between the ages of five and ten, and 39 subsequently to the latter age. Of the whole 560 previously vaccinated, 316 were vaccinated before the age of five years; 133 between the ages of five and ten, and 111 after the latter period. Hence it follows, though not as an exact result, according to Dr. Forry's limited experience, that as the ages of the great majority of these men ranged from twenty to thirty-three (the average being twenty-five), and as the ratio of successful revaccination is very nearly the same after each interval of age (being about one-third), the limit of the protective power of vaccination is not restricted to any precise number of years.

"The only statistics of revaccination of the present army of the United States, we have been able to obtain, are the following, furnished by Dr. S. O. Vanderpoel, Surgeon-General of New York, to the U. S. Sanitary Commission,[2] from the first returns made to him in accordance with a general order:—

Total number of recruits examined	9,548
Bearing marks of previous vaccination	7,765
Total vaccinated or revaccinated	8,095
Found to be susceptible	2,292
Number susceptible who had marks of previous vaccination	1,338

[1] American Journal of the Medical Sciences, April, 1842.

[2] Sanitary Commission Report, E.

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"It is evident, from the foregoing statistics, that no certain period of limitation can be fixed for the protective power of vaccination. It is certain, however, that its loss of power bears *some* proportion to the lapse of time, though it seems highly probable that this apparent loss of protective power is in the same ratio as the varying liability to smallpox, independent of vaccination. Dr. J. F. Marson, the experienced superintendent of the smallpox and vaccination hospital in London, states that 'but few patients under ten years of age have been received with smallpox after vaccination. After ten years, the number begins to increase considerably, and the largest number admitted are for the decennial period from the age of fifteen to twenty-five, and although progressively diminishing, they continue rather large up to thirty, and from thirty to thirty-five they are nearly the same as from ten to fifteen; but as in the unprotected at this period of life, the mortality is doubled, showing the cause to be probably as much or more depending on age and its concomitants, as on other circumstances. In still further advanced life, the ratio of mortality will be seen to increase also, as in the unprotected state.'[1]

"According to the statistics of Professors Heim, of Stuttgart, and Retzius, of Stockholm, and Dr. Marson, of London, the liability of smallpox is found to be, as regards age, very nearly the same as the increased susceptibility to a second vaccination, or, as will presently be seen, to a second attack of smallpox.

"The occasional recurrence of unmodified smallpox a second time, or after a previous vaccination, does not invalidate the general law, that a person who has once been properly vaccinated, or has once had smallpox, in general remains protected against a subsequent attack. It is, however, a well-established fact, that certain individuals who have had unmodified smallpox in infancy or youth, may, especially if frequently exposed to the epidemic influence of the disease, have it again in after life; and such attacks are always much more dangerous to life than smallpox after vaccination. All medical men of much experience have met with such cases. Dr. Thompson, of Edinburgh, in his own practice, met with 85 cases of second attack of unmodified smallpox, and Prof. Heim, 57. It is in vain, therefore, to expect that vaccination will give greater security to the person from a subsequent attack of smallpox than smallpox itself unmodified. All that can be reasonably asked

[1] Returns of Epidemiological Society, London.

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is, that vaccination shall give as good security against a subsequent attack of smallpox as if the person had passed through smallpox itself; and this, if properly performed, and with good lymph, the accumulated evidence of the last sixty years most thoroughly proves. And with this immense superiority in favor of the protective power of vaccination over unmodified smallpox, namely: that it is not contagious; does not endanger life; does not engender scrofulous disease; does not disfigure the countenance, nor cause deafness and blindness; and does not cut off one in every four to eight affected by it—with all of which smallpox is justly chargeable.

† "By estimating the result of the foregoing statistics (chiefly obtained from the returns of the Epidemiological Society of London, and more might be furnished), embracing carefully recorded and reconcilable points of observation for nearly 200,000 cases, we are justified in accepting this experience as a safe criterion by which to base an estimate for any number of cases, great or small.

"The conclusions elucidated from the data given are:—

"1. That vaccination is immensely protective against epidemic diseases generally, and against smallpox in particular; and against death by smallpox the protective power of vaccination is almost perfect.

"2. That of any number of persons who have had unmodified smallpox, the proportion wholly protected from a second attack at adult age is 43 per cent., while 57 per cent. are liable to it again in some form or other.

"3. That out of any number of adult persons who have good marks of vaccination, 40½ per cent. are perfectly protected, while 59½ per cent. are susceptible to varioloid or to revaccination to such a degree as to render their protection perfectly complete.

"4. That the degree of protection afforded by previous unmodified smallpox, from a second attack, is only 2½ per cent. greater than the protection afforded by vaccination; a proportion too small to be regarded as any evidence of real difference in protective power, and reasonably attributable to spurious or impaired vaccination from a variety of causes, such as vaccination during the progress of other diseases, injury of the vesicle, or defective lymph.

"5. That out of any number of adult persons with imperfect marks of vaccination, 23 per cent. only are protected, while 77 per cent. are liable to smallpox or varioloid.

"6. The liability to varioloid after ten years of age, of persons

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vaccinated under three years of age, and the increased liability again from fifteen to twenty-five years of age, of persons vaccinated or revaccinated at from ten to fifteen years of age, demonstrates that, generally, protection by vaccination under twenty-five years of age, is complete for about seven years only. Subsequent to twenty-five years of age, protection is complete for a greater length of time, proportionate to the age of the individual at the time of the vaccination.

"7. That during the prevalence of an epidemic of smallpox there is increased susceptibility to the disease, and the degree of protection from previous vaccination is proportionately lessened. Under such circumstances, therefore, it is incumbent to revaccinate at intervals not exceeding five years; and in cases of certain exposure as soon as practicable thereafter, as there is abundant evidence of the protective power of vaccination and revaccination even as late as the fourth day after exposure to smallpox.

"8. Protection is known to be complete only when fresh vaccine lymph from a perfect vesicle fails to take on revaccination.

A. N. BELL, Brooklyn, N. Y.
J. P. LOINES, New York.
H. D. BULKLEY, New York.
A. NEBINGER, Philadelphia.
JAS. F. HIBBERD, Richmond, Ind."

The foregoing paper the Board of Directors of the Eastern Dispensary, of New York, kindly consented to have set up for publication in the Annual Report of that Institution for the present year, and furnished your Committee, gratuitously, with two hundred copies of the advance sheets, in pamphlet form, to work with.

The purpose of the third resolution was undertaken in all the States accessible to the Committee, but with few exceptions the whole duty of using the necessary degree of influence with the medical and secular press to give the substance of the paper a wide circulation devolved upon the Central Committee. These exceptions are, so far as heard from, individually or by their works, Drs. J. B. JONES, of Brooklyn, N. Y., J. F. MINER, of Buffalo, N. Y., J. M. TONER, of Washington, D. C., E. B. STEVENS, of Cincinnati, Ohio, C. A. LOGAN, Leavenworth, Kansas, Dr. WILLEY, of St. Paul, Minnesota, S. G. ARMOR, of Detroit, Michigan, DAVID PRINCE, of Jacksonville, Illinois, and D. L. MCGUGIN, of Keokuk,

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Iowa, who have taken special pains to bring the object of the Association prominently before their respective communities.

In Brooklyn, our paper was published in the daily papers by order of the Common Council, and in this way obtained a large circulation, not only in this particular community but, by the liberal extracts made by other newspapers, elsewhere.

Copies of our pamphlet were mailed to all the medical periodicals in the country known to the Committee. Many newspapers, also, of large circulation in various parts of the country, have by republication of the paper entire, or by the publication of well-chosen extracts, exercised a most salutary influence, and in this way rendered important assistance.

By these various means your Committee has good reason to believe that faith in the efficacy of vaccination and revaccination is much enlivened and largely on the increase. That, in this country at least, at no former period has the desire for, and the practice of, vaccination and revaccination been so general as during the last winter. Indeed, in many large communities, it has amounted to a *furore*. And proffered gratuitous vaccination in our large cities is, as it should be, fast becoming the rule instead of the exception as heretofore.

There is, however, much yet to be done, much prejudice still to be overcome, in some sections of the country before the people generally can be considered as fully prepared for compulsory vaccination.

Many legislators, measuring the intelligence of the multitude by their own appreciation of the value and necessity of universal vaccination and revaccination, are anxious to move in the matter, and ready at any time to present it to legislative assemblies. But there is in this, your Committee is constrained to believe, danger of too hasty action. The experience of the past, in regard to compulsory vaccination in this country, admonishes us to be cautious lest we raise a spirit of opposition, "on principle," against anything savoring of restraint in a matter regarded as purely personal. People must be first educated into the belief that the right of doing as they please does not include among its privileges the right to have smallpox, and thereby to trespass upon their neighbors. Parents and boards of education must be conscientiously convicted of the criminality of inoculating a school with smallpox, because, forsooth, people have a right to do as they please in regard to their own health.

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Poisoning is everywhere regarded as a crime. And the fatality of poisons generally is scarcely greater than that of smallpox. Why then, it may be justly asked, should there be free license to administer a poison so potent and so loathsome as smallpox?

When the protective power of vaccination against smallpox, and, to a certain extent, against other diseases, and its freedom from danger are made to form a part of the education of every child in the land, no one will then claim the privilege of having smallpox. And it is to nothing short of this degree of enlightenment of the mind that your Committee aspires.

We have already initiated measures for disseminating the paper herewith submitted in the public schools of our large cities, and we hope ere long to reach every trustee and teacher, every parent and pupil in the land.

Respectfully submitted,

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SMALLPOX: ITS PATHOLOGY AND TREATMENT.

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SMALLPOX: ITS PATHOLOGY AND TREATMENT.

It might by some be regarded as heretical in medicine to propose at this late day anything different in regard to the pathology and treatment of variola, from that which was taught by Sydenham, and which has received the sanction and indorsement of the profession for nearly two centuries. The Sydenham pathology and treatment of smallpox may, indeed, be said to have become almost hallowed by time; yet in the face of its antiquity, and its indorsement by so much wisdom, past and present, I have not only ventured to doubt the correctness of Sydenham's pathology of variola, but to demonstrate the insufficiency of his treatment for that disease.

As early as 1856, and at several subsequent periods, I called the attention of the profession to what I regarded as the true pathology of, and the efficient treatment for, smallpox. My views attracted attention, and I have been complimented, as I am confident suffering humanity has been benefited by the adoption of my pathology and the practice of my treatment for variola by many members of the profession, from some of whom I have received written and oral acknowledgments of the completeness and efficiency of the treatment as practised by them.

The treatment Sydenham suggested and practised for variola, and for the promulgation of which he was ridiculed, coarsely denounced as an innovator and murderer, is substantially the treatment of the present time—a treatment in all its characters, from first to last, medicinal and dietetic, reducing, non-supporting, and decidedly antiphlogistic. This treatment was the natural and unavoidable sequence of the adoption of a false pathology, a pathology which taught that variola was an inflammatory disease, than which nothing in nosology, in my estimation, can be more erroneous.

The particulars of the Sydenham treatment of smallpox it is useless for me to recount, they are as familiar to the reader as they are to myself, but as it is essential to my purpose, I shall briefly

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remark this treatment directs that the initiatory or febrile stage of the disease shall be treated with purgatives, cool drinks, neutral mixture, and farinaceous diet; that at the subsidence of the febrile and the introduction of the papular stage, the neutral mixture may be withdrawn, the purgatives and farinaceous diet continued; and this treatment pursued through the papular, vesicular, pustular, and desiccating stages, unless the so-called secondary fever should spring up, and spring up it will, if the case be severe, when the use of the neutral mixture must be resumed, a tapioca and gruel diet given, and the whole treatment, medicinal and dietetic, must be decidedly antiphlogistic, unless, however, typhous symptoms present, when a little beef-tea, a small quantity of milk, and a little wine-whey, and some tonic must be administered. This is the sum and substance of the Sydenham treatment—the treatment taught by the schools, enforced by practice in smallpox hospitals, and clearly, forcibly, and dogmatically set forth in all the books I have met with, which contain articles upon variola. With this treatment in all its parts I shall not find fault—to it, as far as it relates to the initiatory or febrile stage, I yield my acquiescence and cordial support. Thus far can I go, but no farther. Beyond this, I deem the treatment defective, inefficient, and I shall not refuse to say destructive. The Sydenham treatment has been largely developed from the idea that smallpox is an inflammatory affection, and hence demands in all its stages a marked and decidedly antiphlogistic or anti-inflammatory treatment.

It has occurred to me that this view of the nature of smallpox is an error; that it is not essentially an inflammatory disease; and that any destructive or threatening inflammatory affection which may spring up is *accidental*—a complication, and not an integral or inherent part of smallpox; that variola is essentially and radically a *suppurative disease*, or, in other words, that it is a malady in which a large or small quantity of pus, according as the disease is severe or otherwise, is to be generated, and that as a consequence of the generation of the pus, and the effort of nature to throw off the diseased portions of the tissues attacked, an erythema or inflammation is produced in the tissues involved, and that this erythema or inflammation is *necessary* and *required*, to the *successful*, perfect, and safe development and passage of the disease through all its varied and ofttimes severe and exhausting stages. Smallpox, I am convinced, is not an inflammatory disease; that it is not an affection in which its regularly inflammatory phase is the part of the disease

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which threatens the destruction of life, but that it is one of the characters of the malady which is necessary to be produced and regularly developed; that the disease may run its course regularly and safely. If such be the case, it follows that any treatment which may prevent the system from being in a condition to get up, sustain, and carry on this essential, and, if I may be permitted, I will say *vital* portion of smallpox, is irrational, unscientific, and pernicious.

If the inflammation of the tissues attacked by the eruption of variola is necessary to the proper development of the disease, it differs widely from the inflammatory conditions which we call pneumonia, pleuritis, peritonitis, &c. In these and all their kindred affections, the great end desired to be attained is *the arrest* of the inflammatory action, and the *prevention* of the development of pus. But no sane physician desires in smallpox to prevent the inflammation incident to the full development of a variolous pustule, knowing as he does that the pock cannot pass through all its papule, vesicle, and pustule, unless there be inflammation present, as an essential condition; and if he does not desire to prevent, arrest, or destroy *this* inflammation, now as there is *none other* in uncomplicated smallpox, why regard variola as an inflammatory disease, and treat it as if this inflammatory feature was the dreadful, fearful phenomenon of the malady, and proceed with evacuants and by semi starvation to give to it, and as a consequence give to the patient also, his quietus? I ask who ever knew a patient to die because of the pustular or eruptive inflammation of smallpox? Who of us have not seen smallpox patients die, and have not, in some of these instances, prognosticated their death because of the paleness of surface, or the defective inflammatory action of the skin around the pustules? Is it not a source of gratification to the well-instructed physician, when he visits his smallpox patient, to find each pock if it be a case of the distinct variety, or each cluster if it be confluent, surrounded with a decidedly marked and well-defined line of inflammation, each pock well up, full, and elevated? And does he not deduce from these conditions a favorable prognosis? If, on the other hand, he finds the pock without the inflammatory ring, depressed, and presenting the appearance of having had part of its contents removed, he becomes filled with fear for the safety of his patient. He quits his bedside with aching heart, and, in answer to his patient's friends' inquiries as regards his condition, says "it is unfavorable, his skin is *too pale*, the pock is not filling properly." Would he in the instance of the first feel himself justi-

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fied in endeavoring to reduce the inflammatory ring? And would he in the second instance hope to sustain his patient and bring him safely through his attack by diminishing his food, and increasing the doses of his evacuants? Certainly not! Yet if he would bring the first to the condition of the second, he may succeed by giving his evacuants at shorter intervals, and by directing a gruel diet; or he may be able to bring up the doubtful patient to the condition of the well-doing and well-promising one, if he will discontinue the use of his evacuants, and ply him well with such articles of diet as will improve the quality of his blood by increasing the amount of its fibrin—doing, in short, that which he would do to enable the system to carry on any other suppurative disease.

Indeed, the only view which appears to me to be rational in regard to smallpox, *is that it is a vast superficial phlegmon*, and here I cannot withhold a quotation from Dr. Watson's article upon Smallpox. In referring to the varieties of the disease, he says, "The number of pustules indicates, in the first place, the quantity of the variolous poison which has been reproduced in the blood. In the second place, it is also a *direct* measure of the extent to which the skin *suffers inflammation*. Sometimes there are not more than half a dozen pustules, sometimes many thousands. If all these were collected into one, it would be an enormous phlegmon." "For both these reasons," he remarks, "the system suffers commotion, distress, and peril, in proportion to the quantity of the eruption." Yet notwithstanding this view, that when the pustules "are many thousands" in number, "if all these were collected into one, it would be an enormous phlegmon," Dr. Watson suggests, nay, advises and directs, the very opposite dietetic treatment to that which he would advise to be pursued in the treatment of "an enormous phlegmon." In treating "an enormous phlegmon," would we reduce our patient by evacuants and give a gruel or toast and tea diet? Would we not sustain the system with a good and generous diet, that the generation of pus should take place with as little reduction of the strength and forces of our patient as possible; and this we would do because we well know that the production of pus in large amount is accompanied with exhaustion. Does not the system suffer the same degree of exhaustion, whether pus of a given amount be generated in "an enormous phlegmon," or in the pustules of variola? And if to *prevent* exhaustion from the production of pus, in the case of the phlegmon, we direct a generous diet, why should we, in that other suppurative disease,

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where pus is generated equal in quantity to that produced in an enormous phlegmon, pursue the opposite treatment, and give a gruel and toast and tea diet? If the production of pus in the instance of the phlegmon demands a generous and sustaining regimen to prevent exhaustion, why, in the other instance, where the same material is produced, and that in like quantity, is there not required to produce the same effect, the support of the system, the same means to be employed? Or is the generation of pus, in smallpox pustules, *less* exhausting than the generation of the same matter in an extensive abscess?

Smallpox, by writers, and by common consent, has been divided into several varieties: the Distinct, Semi-confluent, Confluent, and Malignant—these divisions being expressive of the severity and extent of the disease; the Distinct variety being the milder, the Malignant the more deadly form of the malady. It is in the Malignant variety that we see variola in its most terrific and uncontrollable aspect. But, be the variety what it may, it is always the same element, the same *Materies Morbi*, which is at work in the blood; producing the phenomena which, when arranged and grouped together, we call variola, or smallpox. The changes which the *Materies Morbi* of smallpox produce in the blood, in the Malignant variety of the disease are the *same*, that are produced in the other forms of the malady; the only difference is that these changes are not so extensive; the difference is only in degree, not in the nature of the changes.

What are the most prominent and attractive changes produced by the variola poison, as exhibited by the blood when that fluid is submitted to examination? A great diminution of the fibrin and the red corpuscles. One writer[1] says: "The characteristic lesions of smallpox are a certain deteriorated state of the blood; it is found entirely liquid and serous, and of a dark color; if coagula exist, they are small, soft, and very dark in color." Dr. Gregory[2] remarks: "To the most aggravated of all cases of smallpox, the terms malignant, or petechial, are generally applied, that from the earliest period of the disease, petechiæ are observed; sometimes the extent of subcutaneous ecchymosis is immense; as the vesicles advance to maturation, they fill, not with pus, but with a thin ichor tinged with blood. Hemorrhages break forth from all the mucous structures of the body. The gums bleed, often profusely. There

[1] Dr. Meigs's Diseases of Children.

[2] Encyclopædia of Practical Medicine, Dr. Dunglison.

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is epistaxis, spitting of blood, vomiting of blood, and the passage of blood at stool." Who of us does not recognize in this portrait of *malignant smallpox*, as drawn by Dr. Gregory, the very likeness, the counterfeit presentment, "of cases we have seen?"

I cannot here, in exemplification of the broken-down condition of the blood, the small amount of fibrin which it contains, forbear giving the history of a case of malignant smallpox which came under my notice. I was called to a lady whom I was engaged to attend in her second accouchement. The messenger who called upon me stated that Mrs. A. was in labor, and desired my prompt attendance. I repaired to her residence as quickly as possible, but, instead of finding her in labor, I discovered that she had fever. She informed me that she had had a rigor, and was then suffering with violent headache and pains in the back and lower extremities. The pains in the back, from their severity, and from her term of pregnancy, according to her calculations, having expired, she regarded as the pains of labor. I, however, diagnosed smallpox, and this I did the more unhesitatingly from there having been two cases of the semi-confluent variety of the disease in the house adjoining Mrs. A.'s. On the morning of the third day, when I visited Mrs. A., she informed me that she felt confident that she was then in labor, and had been for several hours. Upon making the necessary examination, I found the os uteri well dilated, and the labor, in all respects, in good condition. In due time I ruptured the membranes, and within half an hour afterwards she was delivered of a healthy and vigorous-looking male child. The expulsion of the babe was accompanied with a very unusual quantity of blood. Presuming that the uterus had not contracted on the placenta, I quickly placed my hand upon the abdomen, to make friction upon the womb, that it might grasp the placenta firmly, and the hemorrhage by that means become controlled; but I was surprised to find that the uterus was well contracted. I examined, to discover if the hemorrhage continued, when, to my astonishment, I found the blood flowing from the patient in exhausting quantity. I tied and divided the cord, and delivered the placenta, with the full hope and expectation that so soon as it should be removed from the uterus, and that organ should contract completely upon itself, the hemorrhage would cease. But I was again doomed to disappointment. The womb emptied, and contracted well; the flooding continued, abating *only* in violence, but still the amount discharged being so great as to produce exhaustion and threatened

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syncope. In due time I quitted my patient. When I visited her the morning which succeeded the night of her delivery, I found her literally covered with a petechial variolous eruption, epistaxis had set up, the hemorrhage from the uterus had returned, and a low form of delirium existed. The second day after her delivery she died. This was a case, a most violent case, of malignant smallpox. The most curious, interesting, and instructive feature of the case (and it is because of that feature I have recorded it, and here call special attention to it), is that the uterine hemorrhage went on freely and fearfully because of the defibrinized condition of the blood, notwithstanding the uterus was firmly contracted upon itself.

If the analysis of the blood of those who have died of smallpox develops the fact that it is deteriorated, and that that deterioration consists in its being entirely liquid, serous, of a dark color, its coagula small and soft; and if the blood in life of a smallpox patient is found to be so deficient in *fibrin* that hemorrhages result, and that, owing to its deficiency in quantity and quality, these hemorrhages cannot be stayed, I ask if that kind of treatment, the positive effect of which is to reduce the amount of fibrin, or prevent, when it is deficient in quantity, an increased development of that plastic material, can be the treatment indicated in a disease, the very nature and habit of which is to lessen or reduce the sum of the fibrin below the normal quantity? I have not created what I have here given as facts in regard to the condition of blood influenced by the variolous poison, nor have they been created by any one to suit any special theory or hypothesis. They are demonstrable facts, which have been found to connect themselves with smallpox, both ante-mortem and post-mortem; and I have only produced them here to fix attention upon what you know quite as well as those who have recorded them: and yet they are facts, and, as such, suggestive as regards the rational treatment of variola.

A patient dies of a disease, no matter what. After death the blood is examined, and it is found to be deteriorated. It is entirely liquid and serous; its coagula, if any exist, small and soft; in short, the evidence is that the fibrin, the building-up material, the pabulum of the blood, is decidedly deficient in quantity and quality. If that patient had been given freely evacuants or exhaustants, and had been severely, rigidly dieted—small quantities only of farinaceous articles of food given—would we not say that such treatment had had *its share* and part in the production of the condition of blood which we found to exist? At *least*, we would say that the

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evacuants and meagre diet had not had any counteracting power in preventing such condition from springing up where there was a tendency for its development by the morbific agent which produced the disease. In smallpox the facts are that the variolous poison, *before* it destroys life, robs the blood of its normal quantity and quality of fibrin; that, indeed, to produce death, it is necessary that the blood should be palpably and attractively deficient in its plastic material. Will evacuants, and a gruel and toast-and-tea diet, arrest this condition? Will such food, in the small quantities as directed by the books to be given, furnish the system with the elements necessary to raise the fibrin up to, and sustain it at, or nearly at, the normal degree in quantity and quality?

In a regular, uncomplicated case of variola, will any medical gentleman point out any inflammation that exists other than that which is in the tissues attacked by the eruption? But what of *this* inflammation? Is it not an essential part of the disease? Can we have a well and regularly developed pock without that inflammation? Will not that inflammation be the more decided, positive, bright, and well-marked, in a patient of vigorous constitution, than it will be in one of feeble and fragile constitution? Will not the grade of the inflammation about the pustules indicate the degree of vigor of the system? The more exalted the inflammatory action, the more sthenic the system; the lower the grade of inflammation, the more asthenic. If there is in a regularly developed, uncomplicated case of smallpox, no other inflammation than that which is absolutely necessary to the proper development of the pock, then we must have that inflammation; its production is necessary to the safety of the patient; and if necessary to the safety of the patient, why should we do anything which will have even the slightest tendency to prevent it from springing up, or to diminish it after it has sprung up? Should we not do that which will sustain it? Can we do this by a liberal or free use of evacuants, and a defective diet? Do we not give evacuants, and a gruel and toast-and-tea diet, when we desire to diminish or destroy an inflammation? Will not such treatment control inflammatory action by diminishing the quantity of fibrin in the blood? and when we withhold from the economy a due amount of nutriment, do we not do so for the purpose of keeping down the development of fibrin?

Do not bleed in smallpox, say all the books and all the teachers, unless it shall be necessary to do so to prevent damage being done

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by a congestion of the brain, etc., and then bleed, carefully abstracting no more than may be absolutely necessary, for, say they, the system will require all the blood to support it in the last stages of the disease. This is good doctrine, it is true; it squares with all the facts, and is up to the wants and requirements of the disease. In the teaching to save the blood is recognized the fact that all its elements will be required to sustain the patient, to meet the extraordinary drain or demand which will be made upon it during the progress and finale of the disease. What important difference, however, can it make to the patient, whether you rob him of sixteen ounces of his blood, and by thus diminishing its vitalizing powers, you diminish his chances of recovery, or you *prevent* his blood, by withholding a proper amount of food, from having its vitalizing powers sustained, and kept up equal to the demand made upon it? What difference can it make to the patient whether you impoverish his blood by bleeding, or by evacuants, or by withholding a sufficiency of food? In smallpox the pustular inflammation is an essential portion of the disease; the arrest, destruction, or disturbance of it, interferes directly with the regular development of the disease; therefore, any treatment, the effect of which is to arrest, disturb, or destroy *that* inflammation, is unscientific, falls short of the requirements of the disease—is pernicious and dangerous. Hence, as evacuants, and a meagre gruel, and toast and tea diet, control and reduce inflammatory action, such treatment falls short of meeting the necessities of the smallpox. Again, do we not desire a sthenic condition of body in variola? If there is any disease which, over and above all others, requires for the safety of the patient a sthenic condition of system, that disease is smallpox. Are not the direct tendencies of the liberal use of evacuants, and the withholding of a generous diet, to produce asthenia, and to impoverish the blood? Are not the destruction and reproduction of tissues, and the development of pus in large quantities, accompanied positively with exhaustion of the blood of its plastic elements? And will not that exhaustion be in a given ratio with the amount of tissue destroyed and reproduced, and the quantity of pus created? If such be true, then as we have in smallpox a destruction and reproduction of tissues, and the development of pus, we must by necessity have an exhaustion of the blood of its plastic materials, in proportion to the amount of tissue destroyed and reproduced, and the sum of pus developed; to meet which, the Sydenham treatment, the every-day treatment in hospitals and in private practice

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is evacuants, and gruel, tapioca, panada, and toast and tea in small quantities. Will not the chances of a smallpox patient's recovery be lessened as the grade of the disease advances from the distinct variety to that of the confluent variety—from the variety in which there is but a small destruction, and a small reproduction of tissues, and a slight development of pus, to that in which there is a larger destruction of tissues, and a greater production of matter? And will not this lessening of the chances of recovery of the patient be the consequence of the great exhaustion of the blood? and will not this exhaustion of the blood result from the destruction and reproduction of tissues, and the creation of pus? Can this condition be met—the exhaustion of the blood—and hence the exhaustion of the patient prevented, by the administration of evacuants, and the giving only a light diet of slightly nutritious articles, such as crackers, gruel, toast, etc. etc., and those in quantities vastly smaller than the person would require to sustain him in health, even though he lived a passive life, a life accompanied with but little movement or activity?

Let us now turn to the books and see what in their own words they say in regard to the treatment of smallpox. One author (than whom none stands higher, at least on this side of the Atlantic, as a medical writer and teacher) says: "After the appearance of the eruption the regimen must be still cooling, though food somewhat more nutritious may be allowed, such as gruels, panada, toasted bread, and tea, water crackers, roasted apples, oranges, or grapes, milk and water, rennet whey, vegetable broths, etc., reference of course," continues the writer, "being always had to the degree of excitement present. The diet, however, should be strictly antiphlogistic." The same writer further remarks: "That it often becomes necessary to support the system under the prostrating effects of the abundant suppuration, and vast irritation of the pustules; when, therefore, an appearance of flagging is presented, when the pulse begins to weaken, the tongue to become dry and dark, and the extremities to show a want of due action, recourse should be had to tonics, stimulants, and a *nutritious diet*, proportionate to the apparent wants of the system."

Here is recognized the true treatment, a treatment compensative in its character—a treatment which presumes to make the supply of nutriment equal to the wants and requirements of the economy —but unfortunately *the time* for giving is too long deferred. If *after* the system, from the prostrating effects of "the abundant suppu-

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ration and vast irritation of the pustules," begins to flag, "the pulse begins to weaken, the tongue becomes dry and dark, and the extremities show a want of due action," this treatment, this administration of "*a nutritious diet*, proportionate to the apparent wants of the system," should control the bad conditions referred to—should sustain the system—and drive back the tide of typhous symptoms which had set in, and which, if not arrested, would certainly overwhelm the patient and hurry him onward to dissolution—if this nutritious treatment should accomplish so much after such unfavorable symptoms had made their appearance, might not the same nutritious diet, *earlier given*, have *prevented the production of these bad symptoms?* Here, let us inquire, why the bad symptoms mentioned spring up? We will let the author we have been quoting make the reply. "It is often," he says, "necessary to support the system under the *prostrating* effects of the *abundant suppuration* and *vast irritation of the pustules.*" It is, then, "the abundant suppuration and vast irritation of the pustules" which produce "the flagging of the system," dry tongue, weakened pulse, etc. If we know that the abundant suppuration and vast irritation of the pustules produce so great a drain upon the system, as to make it *probable* that these alarming effects may arise, why not *anticipate* and prevent them from making their appearance, by giving the "nutritious diet proportionate to the requirements of the system," at a period so early in the course of the disease as will cause, by its digestion, the blood to be so constituted as to meet the requirements of the system, supporting it, under the abundant suppuration and vast irritation of the pustules?

Permit me here to ask, if the patient, up to the time of the development of the unfavorable symptoms of flagging of the system, dry tongue, etc., had been receiving *only* gruel, toast and tea, vegetable broths, and cracker panada, if the development of these conditions do not of themselves prove that such a dietetic regimen was insufficient and unequal to the requirements of the system; and the recommendation of a more nutritious diet, with the hope of controlling the bad effects of the abundant suppuration and vast irritation of the pustules, is not a full and complete recognition of the truth that a smallpox patient, to be brought safely through his attack, must be supplied with food of such quality and in such quantities as would be given to sustain the system in any other case, where there is a large amount of pus generated, and a large quantity of tissue to be reproduced? Suppose, after these unfavor-

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able symptoms have set up, we should succeed in saving our patient by the generous and nutritious diet; would we not have accomplished this by improving the quality of the patient's blood —by increasing the quantity and quality of its fibrin, its plasma, its vitalizing and sustaining elements? Would the necessity for doing this have existed at this period of the disease, if the patient had been using good and generous nutriment, in large quantities, from the period the papules made their appearance? If a generous diet would arrest the bad symptoms we have referred to, would not such a diet, by keeping the blood well up in its nutrifying elements, have largely tended to prevent the origin of these morbid phenomena?

Few, very few smallpox patients, whose "systems flag, their pulse grows weak, their tongues become dry and dark, and their extremities evidence a want of due action," will be brought safely out of their attack by any treatment, no matter how stimulating and nutritious it may be, if such treatment shall not be commenced until these typhous symptoms shall have made their appearance. If the patient has not been well sustained before, our sustaining treatment for his cure will almost universally be then too late. *Prevent*, not cure, is the true doctrine, as these dangerous symptoms are the effects of an exhausted blood, that exhaustion produced by "the abundant suppuration and vast irritation of the pustules;" *prevent* this exhaustion of the blood, and as this can only be accomplished by giving nutritious articles of food, give them, and give them with an unsparing hand; give them abundantly, freely, and without stint, and, I would say, almost without measure. While the blood is able to carry on the suppuration of the pustules, and to reproduce the disorganized tissues, there will not be any good cause for fearing a fatal termination, if the case be one of uncomplicated variola.

The blood, to be equal to the demand made upon it, when smallpox exists in a bad form, must be well constituted, and this it cannot be if the patient receives a diet made up of gruel, panada, toast, and tea. Such food, in the small quantities given, or the small quantities the patient will or can take, would not long sustain the body if there were no extraordinary drain going on—no unusual tax levied upon the economy. How, then, can such a dietetic regimen sustain the blood when there is an unusual, an extraordinary drain set up by the production of pus equal in quantity to that of "an enormous phlegmon," and the disorganiza-

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tion of a vast amount of tissue? Any form or quality of diet which is not competent to produce a blood in which the plastic elements are normal, or nearly normal—a blood which will sustain the system under ordinary circumstances, *cannot* be *efficient* under extraordinary circumstances, when, for example, there is going on the generation of a large amount of pus, and there exists the necessity for the reproduction of a large amount of destroyed tissue, as is the case in confluent variola.

Dr. West, in his published *Lectures upon Diseases of Children*, in treating of variola, says: "In cases of confluent smallpox, the patient needs to be very closely watched during the maturation of the pustules, for on the second or third day of this process, the vital powers sometimes suddenly fail. The first indication of any such occurrence would be furnished by a subsidence of the swelling of the face and hands, the paleness of the skin in the intervals between the pustules, the collapse of the pustules themselves, attended with a sinking of the temperature of the surface, a great diminution of the power of the pulse. Such a state of the patient," the doctor remarks, "calls at once for the *energetic employment of stimulants* and the *substitution*"—mark you, substitution—"of a *generous diet* for the *previous meagre diet*." The recommendation here is virtually that after, by the use of a starving diet, and the extraordinary drain upon the blood produced by the maturation of the pustules, etc., exhaustion makes its appearance, presenting, as its accompanying phenomena, those mentioned by Dr. West, then "the energetic employment of stimulants, and the substitution of nutritious food for the previous meagre diet," must be had recourse to. But why this recommendation? Had not the previous treatment, part of which was the "meagre diet," been given with an intention, and was not that intention the prevention or arrest of inflammation, and was not that end and intention attained, as evidenced by the subsidence of the swelling of the face, the paleness of the surface of the skin between the pustules, and the great diminution of the force of the pulse? But lo! the end attained, behold the terrible consequences which follow, and to counteract which "the energetic" employment of stimulants and nutritious food is directed. Now, if the patient should be benefited by the employment of stimulants and nutritious food, will not the benefit be manifested in the paleness of the skin being displaced by a redness, the temperature of the surface being exalted, the pulse increased in strength and volume, the tongue becoming moist—in short, by a *return* to that

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better state which existed previous to the skin growing pale, the pulse small, etc.? But, if this stimulating and nutritious treatment should bring *back* the patient to the condition in which he was *before* the threatening symptoms set themselves up, will it not have to be continued, day by day, to sustain the patient until the desiccating stage has been safely passed through? and if so, would it have been any more unwise to have given it *before* the bad conditions made their appearance, and by its use have *kept the patient with the reddened skin, exalted temperature of surface, full pulse, full pustules*, and sthenic condition of system? If it is safe and wise to get the system into this condition, and there maintain it by such treatment, after the unfavorable conditions referred to have made their advent, would it not have been equally safe and wise to have kept the system sthenic when it was so? If the stimulating and nutritive treatment will have the happy effect of restoring the system *after* it had reached a great degree of feebleness and exhaustion, would not such treatment be competent to prevent the body from passing into such alarming extremity? and if so, why not give the nutritive diet and stimulants earlier?

So completely does the idea of variola being an inflammatory affection haunt the minds of some medical gentlemen, that the strictly antiphlogistic regimen is pursued—the meagre diet is persisted in until the blood becomes impoverished, and vitality begins to fade and grow dim, when, taking alarm, and then *seeing* that which ought to have been *foreseen*, that the generation of the pus and the reproduction of so much disorganized tissue would necessarily get up an extraordinary demand for the plastic elements of the blood, and that this demand to be fully met would require the introduction of nitrogenized articles of diet into the system in quantities competent to keep up the plasma of the blood at nearly a normal figure, they then commence that which they should have commenced before—"the energetic employment of a nutritious diet and of stimulants."

In the treatment of variola the principle of action should be compensative; as there is a large demand for plasma, there should be a large supply of food. The very opposite, unfortunately, of this to me natural and reasonable treatment, is recommended and pursued in the management of smallpox. As a general thing, the severer the case of variola, the more attention we give it; and the more attention it receives from the physician, the more strictly enjoined will be the meagre diet, the more limited will be the sup-

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ply of nutriment, until bad, or typhous symptoms develop themselves, and then to arrest them—to overcome that which we had been no little, but nevertheless unwittingly, instrumental in producing by our starving diet—we commence the use of a generous regimen, and thus endeavor to *cure that which we might have prevented.*

Without tiring the reader by any comments upon the treatment recommended for variola by one or more writers, I will submit their recommendations, and kindly ask the application of my argument to them. Dr. Dewees, in his articles upon confluent smallpox, says: "All animal substances must be strictly forbidden, and if the body requires support, the farinaceous and mucilaginous substances should be selected, such as tapioca, sago, arrowroot, and gum Arabic."[1] Dr. Gregory says: "In all circumstances the diet is to be regulated as in *other* cases of *inflammatory fever.*"[2] Dr. Watson remarks: "If the maturation of the pustules should proceed tardily, if they should not fill up properly, nor their contents become purulent, then strong broths may be of use, even wine."[3] Here, in the face of authority highly exalted, before which I have been taught to bow with almost reverential awe, and to whose dicta I have been instructed to yield with almost abject submission, I pronounce my humble dissent from the meagre dietetic regimen—the rice, tapioca, arrowroot, and gum Arabic diet—in such cases of smallpox as by the severity of that loathsome and filthy disease patients have their lives endangered—and offer in lieu thereof, my "*compensative nutritive treatment,*" based, as I think, upon the better idea of the nature of smallpox, which does not see and comprehend it as an inflammatory affection, but a suppurative tissue-destroying, blood-exhausting, blood-defibrinizing malady, requiring as part of the treatment to meet those conditions, and to *compensate* for the severe drain upon the blood, the introduction in large quantities of such nitrogenized articles of diet as shall most easily, most speedily, and most agreeably to the taste and comfort of the patient, meet these requirements. Such a compensative diet I have found, by a comforting and cheering experience of its use, to be eggs and milk—two articles abounding largely in azotized elements, easily obtained, and easy of preparation for the use of the patient.

[1] Dewees's Pract. Physic, p. 195.

[2] Cyclopædia of Practical Medicine, vol. iv. p. 170.

[3] Dr. Watson's Lectures on Variola.

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As a synopsis of my dietetic treatment in smallpox, I have here but little more to say than what I have already said, and which is embodied in the published "Transactions of the Medical Society of the State of Pennsylvania."[1] My practice has been in all cases of smallpox, during the initiatory or febrile and papular stages of the disease, to prescribe an antiphlogistic, medicinal, and dietetic treatment; but to abandon this form of treatment as soon as the papules begin to take upon themselves the vesicular form, and then commence a treatment which, in all its essentials, shall be supporting.

In carrying out this treatment, I have not found any diet so useful and grateful to the patient, or any which gave as little inconvenience to swallow when the mouth, fauces, and throat were studded with pustules, as a combination of eggs, milk, sugar, and ice, made in the proportion of one egg well beaten, half a pint of milk, sugar and ice in quantities suited to the taste and desire of the patient. When the necessity for stimuli has existed, as it does in all cases of the confluent variety of smallpox, I have added brandy, or what I think better, Monongahela whiskey, because for purity it can be more safely relied on, and can be more readily obtained. The quantity of this diet which I direct the patient to use in confluent smallpox is half a pint, or a tumblerful, with one, two, or three large tablespoonfuls, or half an ounce, of Monongahela whiskey added to it, every two hours, *during the day and night.* I have frequently had patients to take as many as twelve eggs, three quarts of good new milk, and twelve ounces of whiskey daily for several consecutive days, and yet, with all this supporting and stimulating diet, this highly nitrogenized food, these poor creatures barely escaped sinking into the grave, some of them having had (notwithstanding they were so vigorously supported with food, and so actively stimulated) that peculiar feebleness and tremor which are always the unmistakable threatenings of dissolution. Here permit me to ask if with all this, as some would call it, excessive nutritive treatment, but which I would dignify with the appellation of *compensative nutritive treatment*, these patients barely survived the wasting effects of the disease, what would have been the result, if, as is too often the case in smallpox, their diet had consisted of a little toast and tea, a small quantity of animal broth, or a boiled egg or two during the day? I know not what reply others may

[1] Trans. Med. Society of the State of Penna., N. S., Part I. p. 176.

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make, but I hesitate not to say that, instead of having had the pleasure of giving them clean bills of health, restoring them to their families and friends, and of being able now to refer to them as the trophies acquired by this humane treatment in the dreadful, fearful conflict, as instituted by smallpox, between life and death, I should have been called upon in sadness to have written for them passports to the grave! I would also remark that in the variety of cases of smallpox to which I have been referring, I do not restrict patients to eggs and milk, but permit them to use meats, poultry, in short any food abounding largely in the protein elements; and, indeed, I do not only permit of their use, but urge those articles of diet upon them, with the *assurance* that in such cases to eat is to live, to abstain is to die.

The petechial form of variola, which should be called malignant, is almost necessarily fatal. The blood is so broken up at once, as if by a sudden shock, and the function of the economy so disturbed, as to defy the successful application of remedial agents. The confluent form of the disease is the next most formidable, but is not by any means necessarily fatal, nor even so unmanageable as some authors and teachers would have us believe; or, at least, such is my experience in the management of it. Yet so grave has this form of disease proved in the hands of all those who have written upon it, that they all declare that not only the majority, but a very large majority, of those attacked with confluent variola die. My experience with this form of the disease, so far from agreeing, or even approximating to an agreement with this statement, widely differs from it. A majority, a large majority, of my cases of confluent smallpox have recovered. I would not be understood to doubt the declarations of those authors; so far from doubting them, I feel confident that their statements are true, and that such will be the experience of all who treat variola after the style and fashion, the manner and form, of our dead and many of our living fathers of medicine. And such will unfortunately, I fear, continue to be the experience of many, who, confiding in the sufficiency of the old or Sydenham treatment, refuse to embrace the new, and, taking courage and confidence, step aside from the old, too well-beaten and too oft-trodden track, to venture upon the new and better one.

Here let me inquire, what is confluent smallpox? The true answer to this interrogatory will be suggestive of the proper treatment for variola. The treatment which will meet the indications which present in the confluent form of the disease will, with proper

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modifications, meet the indications of the other forms of the malady. Confluent smallpox, then, is that form of variola in which the body is wrapped, as it were, in a thick sheet or mantle of pus, and in which there is nearly a complete destruction of the external covering of the body, and sometimes part of the connective tissue beneath the skin. Dr. Watson[1] says the quantity of pus generated in a case of confluent smallpox amounts to quarts. This is doubtless true. In the pustules, when fully developed, the pus exists in a semi-concrete or highly condensed form, but little more than the solid constituents of the matter being present, in consequence of the liquid constituents having, as the pus was being developed, evaporated or passed out of the pustules by exosmotic action. The conditions, then, are the development of quarts of pus—the destruction of much tissue—and great exhaustion. How shall we sustain the system during its development of so much pus, so that but little exhaustion only shall be produced, and the destroyed tissue reproduced? I answer by generously sustaining the patient. But what, under these circumstances, constitutes a support? Will you say bread and tea, cracker-panada, water-gruel, tapioca, and arrowroot? I know this is the diet almost universally given to smallpox patients, no matter how severe and exhausting the attack, or rather, I would say, such is the diet until the patient has nearly or quite reached a fatal prostration, when milk-punch, beef-essence, and such food are directed, even then, and too often presented in too small quantities for the restoration of the patient. Bread and tea, water-gruel, and panada, will not, I am free to assert, even though you could induce the patient to partake freely of such diet, meet the requirements of the economy. The necessities of the system are great, nay, they are more, they are extraordinary, and can only be successfully met by the introduction of the highest order of food, and that in large quantities.

Permit me here to present a case or two in illustration of the efficiency of free nutrition and stimulation in this dreadful malady.

I was called to a woman laboring under an attack of confluent smallpox, who had been treated by another physician. I found her so exhausted that she could not reply to questions in tones audible enough to be heard. She was so exhausted that she could not sustain her head upon the pillow in a line with her body, it falling from the pillow and approximating the bed. The skin on

[1] See Watson's Lecture on Smallpox.

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her face and arms in many places was sloughing. This woman was living—no, not living, dying—on toast and water, arrowroot, and gruel. I at once ordered egg-nog, and directed her to be given a glass every two hours. On my second visit, which was about twenty-four hours from the first, improvement was manifest; she was able to speak so as to be heard, and was able to sustain her head upon the pillow. Between my two visits she had taken twelve glasses of egg nog. Do not, at this announcement, be frightened from your propriety. This treatment was continued day after day, until she was able to take other food. And under this, as some would call it, extraordinary nutritive treatment, recovered.

In August, 1862, I treated a lad of seventeen years, who had a most exhausting attack of confluent smallpox. In the house with him were four others who had the disease in the distinct form. The lad did not come into my hands until the fourth day of the eruption. He was delirious, his delirium closely resembling the ravings of mania-a-potu. He had not slept for forty-eight hours, and it was with much difficulty he could be restrained and confined to his bed. His delirium was controlled with opium, and sleep soon followed. As it was evident, from the extent of the eruption, that the case would be a grave one, I commenced at once to sustain him by the free use of eggs and milk. This was continued for three days, when whiskey was added to the eggs and milk; of this (the egg-nog) he was given as much as he could take. It was manifest that those who were nursing the boy had concluded that he would die, and as the duty of taking care of him was a most disagreeable one, the impression that he could not get well had the bad effect of preventing the free administration of the nutriment. For the purpose of keeping his attendants from neglecting him, I visited the lad three and four times daily, while he was extremely ill, and, upon each occasion, gave him freely of egg-nog. This was one of the worst cases of smallpox I ever beheld. His eyelids were not separated for eleven days. The entire surface of his body was covered with the eruption. The skin in several places was gangrenous, and he became emaciated as I never saw a smallpox patient emaciated before.

Now this lad drank quarts upon quarts of egg-nog and milk, and yet with all this extraordinary nutrition, he became extremely prostrate, much emaciated, and had gangrene of the skin. What would have been the result if he had been given the usual treatment? The patient, under high and free nutritive treatment, recovered,

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and he now lives to proclaim the utility of generous nutrition in confluent smallpox.

THE SECONDARY FEVER.—Before closing, I would be doing injustice to the subject if I were not to make some remarks upon the so-called secondary fever of smallpox—a misconception of the nature of which, in my judgment, has prevented many a patient from receiving the supporting treatment his condition required, and caused him to swallow many an exhausting dose, producing an aggravation of his sufferings, and lessening the chances of his recovery. Dr. Wood says, "Upon the occurrence of secondary fever, the original diaphoretic and refrigerant plan should be continued in a degree corresponding to the excitement and strength of the patient."[1] Dr. Gregory, writing of secondary fever, says: "When the disease (smallpox) has been severe, and secondary fever has set in, the excitement is to be allayed by occasional doses of antimonial powder with calomel, followed by an active aperient."[2] Another author, in writing of smallpox in children, remarks, "that about the fifth or sixth day of the eruption, at which time the maturation is nearly completed on the face, and that process is commencing on the extremities, a new fever to which the technical term secondary fever is applied, makes its appearance. This fever commences to diminish when the suppuration is fully established, and *disappears* about the time that desiccation is nearly completed on the face, and has commenced upon the limbs."[3] Dr. West, in his observations upon secondary fever, remarks: "If the eruption be more abundant, and the accompanying secondary fever consequently severe, an antiphlogistic plan of treatment must be carried out *more* strictly."[4] Dr. Watson teaches, "that the proper plan of managing smallpox patients, during the continuance of the secondary fever, is to keep the bowels moderately open by gentle laxatives or enemata, and to give opiates once or twice a day. The cooling regimen must now," says the doctor, "be given up, and the strength of the patient must be supported by a nourishing diet." It will be observed that in the recommendations of the writers, whose language I have quoted, there is, in the management of secondary fever, a want of agreement. Dr. Wood, in secondary fever, says, "The diaphoretic and

[1] Dr. G. B. Wood, Pract. Med., art. Smallpox.
[2] Encyclopædia Pract. Med., vol. iv. p. 169.
[3] Dr. J. F. Meigs, Diseases of Children.
[4] Dr. Charles West, Lectures on the Diseases of Children.

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refrigerant treatment must be continued." Dr. Watson says, "The cooling regimen must be given up, and the strength of the patient supported by a nourishing diet." Dr. West directs in secondary fever that "an antiphlogistic plan of treatment be strictly carried out." "When doctors disagree, who shall decide?"

Before advancing further, let us inquire what this so-called secondary fever is? What produces it? What is its nature? I think that even by a reference to the quotations I have given from the different authors and teachers already named, or referred to, we shall have a solution of our queries. About the sixth day of the eruption, at which time the maturation is nearly completed in the face and *that process* is commencing in the extremities, secondary fever makes its appearance, says one of the writers. Dr. West says, "If the eruption be abundant, the accompanying secondary fever *consequently will be severe*," etc. Without going further, these two writers unfold to us, as the cause of secondary fever, the maturation of the pustules—the generation of pus. The fever is *introduced* when maturation commences, *diminishes* when suppuration is fully established, and *disappears* when desiccation is nearly completed. The extent and severity of the fever are in due ratio with the number of pustules, the irritation of the skin, and the quantity of pus produced. The conclusion, to me, appears irresistible that secondary fever of smallpox is a pustular or suppurative fever—no more, no less. If this conclusion be correct, the treatment of secondary fever is perfectly clear. The efforts of Nature, at the time secondary fever sets in, are to develop perfectly the pustules and to reproduce the disorganized tissues, and this fever is only an effect of these efforts, it is only one of the phenomena produced by the *vis medicatrix naturæ*, which is at work endeavoring to rescue the patient from death and the grave. Will we not oppose this preservative power if we administer "refrigerants, diaphoretics, antimonial powder combined with calomel, and active aperients, and give only a little of farinaceous articles of diet?" Can such be the proper treatment of a suppurative fever? Are exhaustants and a defective diet the means indicated for the safe and successful management of such a fever? Secondary fever is as much a suppurative or pus-generating, concomitant fever as is the fever which attends the generation of pus in the instance of a phlegmon. In treating a mammary abscess, for example, would we expect to benefit our patient by a strictly antiphlogistic plan of treatment—by refrigerants, diaphoretics, evacuants, tapioca, and arrowroot?

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We would, when we discovered that resolution was impossible to hasten the development of pus, and sustain our patient, give a nutritious diet. Just as little alarm, too, as the suppurative fever, incident to the production of pus, would give us in the instance of a phlegmon, just so little alarm, and no more, should the secondary fever of smallpox give us while it remains sthenic; and to have it remain so, or to cause it to be so if it has been otherwise, we must sustain, not exhaust—we must feed well, not half-starve the patient.

The time when secondary fever exists, it may be said, is the culminating period of smallpox—the period when the causes of exhaustion are at their maximum—the time when all the powers of the economy are most beset, most heavily taxed. Yet all this period, when certainly the most support is required, the treatment recommended by writers and teachers, and that, too, which is most practised, is to give the least support, and not only this, but to add to the exhaustion incident to the disease, that exhaustion which is produced by the use of refrigerants, diaphoretics, and active aperients.

To me the great object to be attained in the management of the so called secondary fever of variola has been to keep it sthenic. As the maturation of the pustules is the cause of that febrile condition, its grade will depend upon the vigor with which the maturation or perfecting of the pustules goes on. If they maturate rapidly and promptly, the fever will be decided and sthenic; if the pustules maturate slowly and doubtfully, then the fever will be typhoid in its form. This is the condition to fear, therefore the condition to prevent; and as this can only be done by supporting the system, or by placing at its disposal such articles of diet as will enable it to carry on the maturation of the pustules rapidly, promptly, and decidedly, I cannot see any reason why, during the continuance of the fever, food should be withheld, antimonial powder, calomel, and active aperients should be administered. But I do see the positive necessity for the avoidance of exhaustants, and the administration of a highly nutritious and supporting diet; and seeing and regarding this necessity, my practice has been to give liberally nutritious articles of food, and I have abundant cause to be gratified with the good effects which I have witnessed flow as consequences of their use.

My treatment, when secondary fever has dawned, has not been to alter or abate in the least the use of my compensative, nutritive, and stimulating treatment, but to continue it, rather increasing than

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diminishing its vigor as the fever progresses. This fever I desire to sustain, regulate, not destroy; and this I accomplish by giving freely and abundantly, highly nutritious articles of diet, and, if needs be, stimulants. The results of this treatment have been to me evidences of the correctness of my views of the nature of the so called secondary fever of smallpox.

NOTE.

On examining my statistics of smallpox, from which are excluded all cases of varioloid, I find that my percentage of deaths is 1 in 15.61. These results I respectfully present as demonstrating the correctness of my pathology, and the completeness of my treatment for variola. Knowing, too, as I do, that this low percentage of deaths contrasts favorably with that resulting from any other treatment.

"By its fruit shall the tree be known."

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A PAPER

ON THE

PROPRIETY AND NECESSITY OF COMPULSORY VACCINATION.

BY

J. M. TONER, M. D.,

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A PAPER ON THE PROPRIETY AND NECESSITY OF COMPULSORY VACCINATION.

THE reflection is not flattering to man's self-love that disease, or eminent susceptibility to it, is the almost invariable concomitant of his physical existence. But as an offset to this infirmity he is endowed with intelligence and reason capable, in a great measure, of relieving actual suffering, and lessening the liability to disease, by controlling the circumstances which surround him, and may thus render life a pleasure or a burden as he wills.

If it be true, as assumed, that man, by a wise forethought and the exercise of his best intelligence, can protect his health and control the ravages and mortality from specific and preventible diseases which overtake the ignorant and improvident, it is clearly a sacred duty for the custodians of the public welfare to see that the effort is made. It is eminently proper, if not the duty of physicians, who are by virtue of their profession the friends and advisers of the people in regard to their health, to inform them and their rulers of what is essential to be done, or to be left undone, to secure this end. Regulations for the preservation of the general health, we think, ought to be concerted between the legislative authorities and the medical profession, and should not only be recommendatory, but to a considerable extent compulsory in character. Fickleness is so common a weakness of human nature, that a duty which begins with the individual and extends to the public, and is left entirely to individual judgment or inclination, is in the end almost certain to be neglected, or performed in an unreliable manner. In the execution of most measures which protect and elevate the human race, the mass of mankind require to be governed and directed by positive law, or the force of an inexorable public opinion.

The assumption that the individual has the right to protect or abuse and neglect his own health at pleasure is false in morals, and, as we believe, equally in opposition to the social and statutory

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law. And as a numerous population is of the highest importance to the strength and welfare of a nation, it should be the anxious study of legislators to favor that end by the enactment of such laws as will best protect the health and lives of the people. It is a well-known fact in the economy of population that the conditions which most favor the multiplication of the human species are health, the enjoyment of peace, and an abundance of food; and, *per contra*, of necessity, the conditions which most seriously retard the increase of population are pestilence, war, and scarcity of food.

The Eastern nations were, from the earliest ages of historic record, visited by occasional pestilential plagues, so terribly devastating in their career as almost to depopulate whole cities and extensive districts of country. Yet historians do not hesitate to say that, vast as was the mortality from the plague, it was even exceeded by that of the smallpox. This fell destroyer and marrer of the beauty of the human form was confined to no country or climate, and spared neither sex nor age. Up to within the last hundred and fifty years it was the most frequent, the most fatal, and the most injudiciously treated of all the pestilences that have afflicted mankind. Owing to the meagre and unsatisfactory records of disease in the early ages of the world, it is now probably impossible to determine at what period smallpox first made its appearance among mankind. Doctors, equally eminent for their scholarly lore, and noted for their laborious researches into the history of diseases, entertain different views as to the antiquity of its origin. Some believe that it first manifested itself in the sixth century; others place its origin several centuries later; while not a few of the ablest scholars contend that its existence can be traced to a period anterior to the Mosaic record.

Without the time to fully investigate this part of the subject, which is but of minor importance to the question under consideration, I am nevertheless inclined to believe in the very great antiquity of smallpox—say from about that period in man's condition and habits when the employment and domestication of animals was adopted as adding to his comforts and conveniences.

There does not seem to be much doubt that variola has existed in Arabia since the sixth century, and, advancing westward, reached England about the close of the eighth, and became general throughout Europe in the twelfth. Notwithstanding the accumulated experience of practice, the medical profession during all that time had discovered neither preventive nor cure, remaining a sad spec-

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tator of its desolations, and utterly unable to afford relief. It defied alike the measures devised by civil rulers and the appliances of medical science, continuing for ages unimpeded in its work of death and disfigurement.

For more than a thousand years the only means known to mankind that gave any hope of escaping the ravages of smallpox was in flight from it, or in the institution of a rigid quarantine. These modes have been largely practised both by civilized communities and the savage races.

The step which first led the medical profession to an improvement in the mode of dealing with smallpox was the accidental discovery, by travellers, of a practice common among the country people in that part of the Turkish Empire known as the Levant. The practice was exceedingly strange, a reversal of all theories, and seemingly very unphilosophical. It was neither cure nor preventive, but the "engrafting" of the actual disease upon the patient, which experience or accident had taught them would induce a milder and safer form of the disease than when contracted casually from contagion.

It is probable that the practice of variolous inoculation was begun among unlettered people in different parts of the world, having no communication with each other, or knowledge that similar expedients had been resorted to elsewhere. When, however, attention was drawn in England, by Lady Mary Wortley Montague, to the "Turkish mode of engrafting the smallpox," and the history and antiquity of the practice had been investigated, it was found to have been in vogue, time out of mind, in China, Hindostan, Africa, and, strangely enough, even in England, among the highland Welsh.

Necessity, guided by observation, rather than devotion to any theory, led to this discovery by the people, as no satisfactory reason has yet been given why the induced disease should prove milder than the same disease taken casually. And yet such is the undoubted fact. The early chroniclers of inoculation announced it to the profession and the public with the most extravagant eulogies of its safety and certainty in obtaining a mild development of variola, and which always gave perfect security against further attacks.

The practice, notwithstanding these facts were in the main conceded to be true, met with the most violent opposition from a few medical men and theologians, on the ground that it was sinful to

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subject any person to sickness, however laudable the intent might be, and insulting to Divine Providence to seek to escape from a disease sent by Him. This practice—the first great step in the protection of the human family from the terrors and havoc of smallpox—after many years, and much effort on the part of the profession, became popular with the people, both in Europe and America, and has been the means of saving millions of lives.

The percentage of deaths from inoculation, even in the infancy of the practice, was never greater than one in fifty, and through the improvements suggested by experience, soon ceased to be greater than one in five or six hundred. These proportions presented a great contrast to that observed in the casual disease, where the deaths remain steadily at one in every five or six attacked. Important and efficient as was this measure in the preservation of life, yet it was possessed of one insurmountable objection, which was that it kept alive the seeds of variolous contagion, and while it saved life with one hand, with the other it distributed an infection dangerous to all who did not flee from its sphere of action, or avail themselves of the same mode of protection. The practice of inoculation began in 1721 in Europe and America, and continued to grow in favor, and retained the confidence of the public and the profession until the close of the eighteenth century, when it was superseded by Jenner's immeasurably important discovery of vaccination.

I will not encroach upon the space allotted to me in recounting the steps which led Jenner to the discovery of the prophylactic power of the cowpox in preventing variola, as they are faithfully recorded in nearly all the medical text-books, but will proceed to the consideration of the best mode of securing the benefit of this protection to every individual in society. The discovery, however, was the result of duly weighing the traditions of the people, and prudently testing their value. He published the result of his experimental cases in June, 1798, under the modest title of "*An Inquiry into the Cause and Effects of the Cowpox.*"

At an early period of his experiments, Jenner looked upon the cowpox as a new disease, originating in the cow; but he soon saw cause to change his opinion in this particular, and ever after looked upon it as the smallpox modified in passing through the cow. Others took up the idea which he had abandoned, and maintained that it was in reality a new disease, and acted as an antidote to

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variola in destroying or changing the variolous elements found in the system during its development and course.

The variolous inoculations made by Jenner to test the completeness of the protection afforded from smallpox through the constitutional impression made by the cowpox taken casually, and also upon those in whom it had been induced by vaccination, warranted him, he thought, in concluding that its prophylactic powers were perfect and permanent. He therefore recommended the practice of "variola vaccina" to the profession, as a substitute for variolous inoculation, chiefly because the former is unattended with suffering or danger, and is applicable to all ages and conditions of life, and gives an equal protection with the latter against the casual smallpox.

A violent and persistent opposition to the practice was immediately inaugurated by a few medical men, on the most whimsical grounds, one of which was, that it being a bestial disease, would, if adopted, prove more disastrous to the human family than the smallpox had ever done, by developing new diseases. These ungenerous and bigoted opponents of the new measure were unable long to prevent or retard the operation of the practice of vaccination, as the certainty of escaping a tedious confinement, along with the danger and suffering consequent upon inoculation, was an argument too powerful for any merely theoretical opposition. The different European governments, soon after the announcement of the discovery, instituted learned commissions to investigate the facts and the prophylactic powers of vaccina. The reports from these commissions fully sustained all that Jenner claimed for his discovery.

Dr. Jenner early declared his opinion in regard to the prophylactic properties of the cowpox to be that they were governed by the same law as smallpox, both being equally protective, but neither being absolutely so. However, as the practice became more general, and received the indorsement of the whole profession, he became more sanguine, and declared his conviction that the prophylaxis remained complete during the life of the individual.

But, considering everything, the author of this discovery was singularly fortunate in the general correctness of his observations and deductions as to the source of the virus, and the best mode of propagating the true disease. Experiments corroborative of his theory were soon made with matter obtained directly from the heel of the horse, which produced a vaccine vesicle in the human sub-

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ject identical in appearance with the cowpox, and which gave an equal protection against the smallpox, as was proven by the test of variolous inoculation.

The early tests of the completeness of the prophylactic power of variola vaccina against variolous contagion seemed to justify the sanguine expectations of the profession and the public, but time has fully verified the correctness of Jenner's first impression, that it gave the same protection that variola itself gave, and no more.

The practice was promptly adopted in all civilized countries, and even introduced among the heathen and the savage races of men, and has been, under Providence, the means of preventing more suffering and prolonging more human lives than any invention or improvement in the history of the world.

Jenner gave specific directions to guide operators in distinguishing the true protective vaccine vesicle from the spurious, the time when the lymph should be taken for propagating the disease, how to preserve it fresh for use, the mode of operating, and the characteristics which it is essential for it to present upon the different days of development, maturation, and decline, in order to impart to the system its full prophylactic power. The operation of introducing the matter is so simple that it has encouraged a large and promiscuous domestic practice, in many of which cases it is feared the conditions essential to giving a constitutional protection have been absent, so that no reliable security against variola has been obtained. The opinion widely prevails with the people that the only evidence required of a successful vaccination is the production of a sore upon the arm, and the more inflamed it becomes, the more convinced are they that their protection is complete. Experience in the practice, and the increasing frequency of variolous attacks after vaccination, reputed and real, have shown the folly of intrusting the practice to the inexperienced, and demonstrates the necessity of paying strict attention to all the directions laid down by Jenner and later vaccinators.

I deem it unnecessary to produce authorities to prove how complete an exemption is obtained, at least for a time, by a constitutional vaccine impression. That its prophylaxis is more complete at first, and diminishes by lapse of time, is sufficiently proven by the fact that, in the great smallpox hospitals, both in Europe and America, scarcely an instance occurs of a person under ten years of age, who bears evidence of having been properly vaccinated in

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infancy, and a death from variola, after recent and complete constitutional vaccination, is a thing almost unheard of.

Many of the European governments took measures, immediately after the character and reliability of vaccination were established, to make the practice general and compulsory throughout their territories. The wisdom and foresight of this policy have been fully demonstrated, for an epidemic smallpox, of any severity, has not occurred in Austria or Prussia for the last fifty years. And although the British government was fully satisfied of the value of the vaccine prophylactic in the preservation of human life, no measures were taken to make it compulsory, or to forbid variolous inoculation, until 1840. In 1853 an Act of Parliament was passed making it a penal offence for any British subject to fail to protect himself by vaccination.

The first year after the passage of this law making it a penal offence to neglect vaccination, the number in Great Britain who sought protection from it more than doubled, and the mortality and decumbents from smallpox proportionately decreased. From an imperfection in the law not naming the officer whose duty it was to enforce the penalty, the practice in a few years lapsed into neglect, but recent amendments to the act have made it efficient, so that it is now working satisfactorily, and will, if faithfully executed, give the nation almost entire security from smallpox.

There may be some diversity of opinion as to the steps proper and necessary to be taken to secure every individual in society the full protection which a successful vaccination gives against variola, though to our minds it is clearly a question to be settled by our legislators, upon the principle that it is their duty to secure the greatest good to the greatest number. In this particular instance, all would be benefited and none injured. With us the belief had become prevalent that the temper of the American people would not tolerate any interference on the part of government in matters of a purely personal and domestic character. The experience of the last few years, however, shows us to be as submissive to the will of rulers and governments as any people on earth. There is not only wisdom, but a necessity for a people loving liberty and cherishing independence, to guard with jealous care every encroachment upon their political rights and constitutional privileges; but it is believed that similar reasons would not be urged or found pertinent against hygienic measures which aim to secure the health

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of the individual, while equally protecting that of the whole community.

The fact is conceded on all hands that the true vaccine disease, which is in all cases perfectly harmless, does, for a limited time, give almost perfect security against the contagion of variola. This being true, it is not only the interest of the individual, but the duty of the government, that such measures should be enforced as will secure vaccine protection to every member of society. For the deduction is irresistible, that if vaccination does possess the prophylactic powers claimed, smallpox only exists among us in consequence of the neglect to apply the preventive. Every person, who is at all familiar with the laws relating to public health, in large cities and throughout the States, knows, that as regards protection from smallpox, they are utterly inefficient and delusive. We therefore conceive that the government can no longer in justice ignore the fact that means exist, and are at their disposal, of saving annually in the United States the lives of forty or fifty thousand persons from death by smallpox, and of protecting double that number from lengthened suffering, deformity, and mutilation.

The medical profession is unanimous in the belief that the universal application of the vaccine prophylactic, and the repetition of it at proper intervals of time, will ultimately exterminate the smallpox from among us, or render it entirely harmless. This belief is not founded upon theory alone, but upon the experience and accumulated evidences of its power, gained by practice and observation during nearly three-quarters of a century.

If the legislative and corporate authorities of our country believe the facts here set forth—and, if doubted, they can be overwhelmingly substantiated—it is manifestly their duty to inaugurate measures to secure effective vaccine protection to every person, without distinction, residing within the sphere of their authority. Indeed it is not creditable to the intelligence nor humanity of our rulers, nor to the influence which the medical profession should exert, that smallpox has been permitted to tarry so long among us, slaying its victims almost without hindrance, when an almost certain and safe preventive is within the easy reach of all.

The doctor who has vaccinated a family with pure Jennerian vaccine lymph, taken at a proper time from a fit subject, and has watched its passage through the various stages of its development and impression upon the system, and observed that it is regular in every particular, according to the rules and type laid down by

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Jenner and others, and then tested the security which they have obtained by the reintroduction of fresh vaccine lymph, feels as confident of their safety from an attack of variola as he can of anything in the future.

An example of the promptness and efficiency with which vaccination, when universally applied to a class or a community, can arrest and control the spread of variola, even in the midst of a severe epidemic, was recently given in the city of Washington. Sporadic cases of smallpox began to manifest themselves among the troops in their camps shortly after their arrival here in 1861. The contagion finally extended to the resident and floating population, and for two years prevailed as an epidemic.

The corporate authorities directed their ward physicians to vaccinate, free of cost, all who would call for that purpose, and the profession generally exerted their influence to have every person vaccinated or revaccinated, so as to be in a known state of vaccine protection. In January, 1864, after the disease had been prevailing for over two years, the metropolitan police took a careful census of all the persons unprotected by vaccination from variola, and they were found to amount to about one-sixth of the resident population.

During the period of the prevalence of variola, the colored population was largely increased in the District of Columbia, in consequence of their liberation by the progress of war, and the emancipation acts, and it was among them that the example of the prompt arrest of the smallpox alluded to was effected. The disease, as was to be expected, extended from the soldiers and citizens to the "contrabands" collected for safe-keeping within the city and crowded into camps during the early period of the war. Fortunately for these colored people, the military control under which they were held, enabled the surgeons in charge to have them all freshly vaccinated, and to take other necessary measures to control the contagion. This general vaccination promptly and effectually broke the force of the epidemic among them. A few cases only occurred afterward, and they were chiefly among new arrivals and those who had found temporary employment in the neighborhood, and thereby escaped the vaccination. The protection so promptly secured for this unfortunate class of persons under such unfavorable circumstances, can be readily gained for all others more favored with the comforts of life, if the means be judiciously used.

Vaccination is compulsory in the American and all European

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armies, which is, no doubt, the secret of their exemption from variolous epidemics. It is a rare thing for the old soldier who has been repeatedly vaccinated to be the victim of smallpox. New recruits, camp followers, and the denizens of cities and towns in and around which armies are encamped, are most likely to be the sufferers, because they are under no compulsion to protect themselves by vaccination or revaccination.

So confident are military commanders of their ability, by timely vaccination and revaccination, to prevent the smallpox from becoming troublesome among their troops, that it is made a standing regulation for all recruits to be vaccinated on entering the service. And should variola break out and prevail to any considerable extent in a division of the army, it is taken as an evidence that the surgeons in charge have neglected their duty. When the difficulty becomes serious, charges are preferred against the surgeon, and if the facts do not contradict the presumptive neglect of vaccination, he is dismissed the service.

It is as much the duty of our civil rulers to protect the health of the citizens over whom they are appointed to preside, as it is for military commanders to preserve the strength and efficiency of their armies. Health is no less important to the prosperity of communities at large than it is to the success of our army.

A practice, that has proved successful in protecting large bodies of moving troops throughout all their departments, can be made equally efficient in protecting every member of society. The experience, which has been gained on the subject of vaccination and revaccination, and its prophylactic efficacy when recently performed, warrant the profession in entertaining the confident belief that variola can be annihilated, or rendered harmless, if the authorities will enforce universal vaccination. The individual who is not protected from smallpox by vaccination, or who has not had that disease, is in a condition liable on the slightest exposure to be attacked, and thus become the centre and source of spreading a loathsome malady which may destroy the lives of others. The question of the prophylactic power and safety of vaccination is so well settled that the individual, who fails to protect himself against variola by it, should be looked upon by the community with aversion, and treated as a nuisance (as he really is, so far as the social interests are concerned), and be compelled to submit to vaccination for his own safety and the protection of the public.

Parents and guardians have no more right to withhold or neglect

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to provide vaccination for the children under their protection than they have to jeopard the lives of these helpless infants by not furnishing them with food or clothing. It is criminal to neglect either, as death may be the consequence, but the failure to provide protection against the smallpox seems to be more maliciously wicked than to neglect either food or clothing, as the former may not only cause the death of the child, but be the means of spreading disease and death among many others, while the evil which arises from the latter ceases with the death of the victim.

The neglect, or almost criminal delay and indifference of many persons to vaccinate those dependent upon them, renders the interference of the civil authorities in the matter just and necessary, and it is therefore conceived that no person can with any degree of justice complain of the establishment of a regulation, general in its application, which will secure protection from the smallpox to all. A compulsory mode is the only one that will ever secure protection to those whose indifference or prejudice causes them to neglect themselves, and thereby endanger the safety of the communities in which they reside.

The right is almost universally conceded to belong to all legislative and corporate authorities to restrain, under proper regulations and for the public good, those who may be suffering from contagious diseases, the insane, and those who are evil disposed to their neighbors. All sanitary measures are founded upon the principle that the well have the right to impose such restrictions upon those sick of contagious disease, as experience has demonstrated will control its spread and protect the community. Smallpox hospitals should be supported by cities, to which every case occurring in crowded houses and thickly populated neighborhoods ought to be promptly removed, if possible. All persons attacked with variola who have neglected to comply with such regulations as the corporate authorities may have directed for the protection of the individual, and for public security, should unquestionably be removed to the hospital, so that they may no further endanger the health of the community. But how much more wisdom there would be in a government forestalling by timely legislation the spread of a preventible disease, dangerous to life, than in waiting until it becomes epidemic, and then be compelled to resort to harsh and distasteful measures to restrict or extirpate it. To accomplish the prevention of smallpox is a desideratum of the highest importance, and to this end we ask for the adoption of

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no new principle in hygienic legislation; but we do ask for the efficient application of those powers which it is incumbent on all custodians of the public health to exercise with enlightened judgment. We insist that the intelligence of the age and the security of public health demand that the legislative authorities should abandon the policy, which has ruled for years, of taking no action in regard to vaccination—in itself a mistake, if not a crime, and which is costing the country annually the loss of from forty to fifty thousand lives—and at once adopt a mode more in harmony with the spirit and requirements of the times, and eminently democratic, as it only exacts of the few a temporary sacrifice of convenience for the permanent benefit of all.

We believe that the universal application of the vaccine prophylactic at an early period of life, and its repetition at proper periods, will ultimately exterminate the smallpox, or render it of very rare occurrence.

The regulation adopted by some school boards, of requiring children to produce evidence of their having been vaccinated before they are permitted to attend the public schools, is a wise and proper precaution. But the measure is partial, and does not go far enough to effect its purpose. The regulation should be made to embrace every member of the family, and all the inmates of the house from which the children come. The parents of scholars and others residing with them may be unprotected from smallpox, or the disease may actually be at the time in their house, yet the children attending school may escape the infection by virtue of the completeness of their vaccine protection, though they may carry it with them to school and give it to others less perfectly protected, either from original defect in the operation, or become so by lapse of time. All colleges, private schools, and institutions of learning ought to adopt the same regulation, and require vaccination as a condition precedent to admission.

If public opinion gives its sanction to the compulsory vaccination of those attending free schools, and the plan has worked to the interest of the individual and the public, I can see no good reason for not extending the principle so as to embrace the whole community. No school can be safe from variola for any considerable length of time, so long as the majority of the people of the district, from which the scholars come, remain unprotected. It is the duty of our rulers, and those responsible for public measures, to protect every member of society from preventible sickness; and

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we can see no excuse or justification for not making a special provision of a compulsory character in a measure of such utility and general beneficence as vaccination is conceded to be.

It is believed that intelligent public opinion is prepared to second, by efforts of a legislative character, measures to secure the general application of the vaccine prophylactic to every citizen; and it is confidently believed, that, if the practice be faithfully carried out with this spirit, it will almost eradicate variola, and will yearly save to the country thousands of valuable lives. The necessity for infantile vaccination is almost universally conceded, yet conviction is by no means so general in favor of secondary vaccination. But the profession believe revaccination to be nearly as essential to the continued protection of the individual and the safety of the community as the primary. This opinion may seem ultra to some, but the position is fully sustained by the extended and accurate observations made in the European armies, and the voluminous statistics collected and condensed in the report of the Committee of the American Medical Association upon "Compulsory Vaccination."

That the protection gained by vaccination against variola is not in all cases permanent, is too evident to require proof in this place. And that cases of variola occur more frequently after the lapse of a second series of five years from the time of vaccination than during the first, is substantiated by the observation of every physician in general practice, and particularly by the reports from smallpox hospitals.

There are a few persons, estimated at from one to two in the thousand, who are not susceptible to the influence of the vaccine disease, and who are equally exempt from the infection of variola. This small class of persons seem neither to be liable to the disease themselves, nor do they act as mediums to convey it to others. There are also a few, about eight in the hundred, who never lose the protection gained by a complete vaccine impression in infancy. It must, therefore, be apparent to the most indifferent observer that the chances of escape from the casual smallpox are too few to decline vaccination, and even too uncertain to justify an objection to revaccination. The mortality attending a given number of cases of casual smallpox is as great at the present day as it probably ever was, ranging steadily at about one death in every five or six attacked, while not one death occurs in a thousand who are seized after recent vaccination. These facts show, as conclusively as anything

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possibly can, the propriety and necessity of vaccination and revaccination.

The theory, which obtained with the profession at the period when vaccination was introduced, was that smallpox never attacked the same person a second time. The exemptions from second seizures are certainly of noticeable frequency, but are by no means invariable. The proportion of second attacks is variously estimated at from 1 in 250 to 1 in 10,000.

All the early experiments to test the prophylactic powers of vaccination were made upon persons recently vaccinated with matter that had passed through but few systems, or upon those who had the disease directly from the cow; and, as they resisted variolous inoculation, it was hastily assumed that the exemption was complete and permanent in all. The experiments of the first few years seemed to warrant this mistaken conclusion, and it is now a strong argument in favor of the diminishing powers of the vaccine protection, as well as in favor of matter recently derived from the cow, that scarcely any cases were attacked with variola for more than ten years after the discovery of vaccination. The evidence upon which the permanency of the prophylactic power of vaccination has been impeached, has been closely scanned by the profession, and reluctantly conceded to be conclusive.

It was for a long time apprehended that the fault or failure of protection after vaccination was in the quality of the matter used in propagating it, or from some accident to the vaccine vesicle during its course. The statement was made by Jenner, and is well known by the profession to be correct, that but slight variation from the normal course in the development of the vesicle will prevent it from giving that constitutional impression which is essential to complete protection. Others held that the cowpox was an antidote to the smallpox, destroying or changing in some manner the cell formation in which the latter has its origin, and that when this is completely accomplished by a single or repeated introduction of vaccine virus, the patient forever after remains proof against variola. The quality of the vaccine lymph used, the mode of introducing it, the number of vesicles essential to protection, and their characteristic appearance, have all been closely scrutinized, with the hope of finding the cause of failure in the mode of practice, and not in the nature of the vaccine itself. As nothing essentially wrong could be discovered in the mode of practice, another question arose as to whether vaccine matter lost

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anything of its prophylactic powers in passing for years through the systems of great numbers of persons. This question was investigated by both the British and the French national vaccine boards, on behalf of their governments, and it was decided, after comparative tests on their part of lymph fresh from the cow and of that which had for years been passing through the systems of individuals, that they presented no appreciable difference. Later investigators in each of these countries have modified these opinions, and similar boards have recommended an occasional return to the original source for supplies of genuine matter for propagating vaccina.

Nearly all early investigations as to the durability of the vaccine protection were made upon the presumption that there is no tendency in the system to repossess itself of the elements which render it liable to variola. The fact was not remembered or conceded in argument that even the confluent smallpox did not always confer permanent protection against future attacks. If patients confined to the infectious atmosphere of smallpox hospitals were occasionally to be seized with relapses soon after a first recovery, instead of being attacked, as is usual in such cases, many years later, and often without a knowledge of the source of the contagion, we should be inclined to regard with some favor the theory of incomplete exhaustion of the variolous elements. Considerations of the kind named warrant the belief that the system in time regains either partially or entirely its receptivity to variola, which had been enfeebled, not destroyed, by the attack, whether of the casual or induced variola, or by vaccination itself. But we conceive that by far the most frequent cause of second attacks of variola and of smallpox, after vaccination, to be that the system regains by lapse of time those elements, temporarily exhausted, which render the system liable to variola. This proceeding is in accordance with a general physiological law governing the recuperation of all organized bodies, which is to repair their injuries and recover strength and return to their normal state as speedily as possible. And susceptibility to variola is a condition common to the whole human family.

The period of time which so weakens the protection temporarily gained, whether from the casual or the inoculated smallpox, or from vaccination, leaving the system again liable to smallpox, cannot be definitely stated, and is perhaps controlled in each individual by some constitutional peculiarity. And as the duration of the protection gained from variola by vaccination cannot be definitely de-

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termined, the safety of the individual and the community requires that vaccination be begun in early infancy, repeated in childhood, and again had recourse to about the period of puberty, and perhaps still again later in life, to retain the system in a state of complete prophylaxis.

A spirit of distrust in the protective power of vaccina over variola immediately began to manifest itself among the people when they found that it was not permanent in its effect. This distrust has unfortunately acquired such an influence as to well nigh produce that condition of non-protection, from which epidemic smallpox may at any time break out and prevail with its wonted frightful mortality. The recommendation of the profession to supply from time to time the exhausted vaccine prophylactic by revaccination is often refused by the people, and, it is to be regretted, is thought to be unnecessary by some of the medical faculty.

Vaccinators, who have had much experience in the use of lymph taken directly from the cow, assure us that it produces greater constitutional disturbances, and more severe local effects than matter taken from the human subject, many removes from its original source. This being true, it ought to settle the question in favor of returning frequently to the original source, so as to be sure of having matter of the highest known protective power. How many years it may be used, and through how many individuals it may pass, and yet impart protection against variola, I will not attempt to decide. The belief is warranted by experience that vaccina loses something of its vigor and perfection, though retaining its chief external characteristics, and gives protection to a less degree the further it is removed from the original source.

The State of Maryland has a judicious law upon this subject, which requires that "all vaccinations are to be performed with matter not more than four removes from the cow." There is maintained at Naples an establishment, founded over fifty years ago by M. Galbiati, for propagating the cowpox among heifers, with a view to keep up a perpetual supply for the use of the profession. When vesicles have arrived at a proper state to convey the protective disease, the animal is driven around from door to door of those desiring to be vaccinated with the lymph directly from the cow. The royal family and nobility patronize this method, and all who are able to afford the expense prefer it to the ordinary method, which is cheaper.

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European practitioners prefer the method, originally recommended by Jenner, of using lymph fresh from the vesicle in vaccination. It is to be regretted that in the United States the crust has been almost entirely substituted for the lymph in propagating the disease.

Of late there has been much said through the public press and medical journals of other diseases having been conveyed through the inadvertence of the operator using impure vaccine matter. No facts have come to my notice that authorize this statement. Where the crust is used, such an untoward result is possible, and the public deserve to be protected against the possibility of danger through this source, and therefore the legislative and corporate authorities ought to make provision for furnishing the profession with an adequate supply of pure vaccine directly from the cow. The government should assume to furnish the profession, for the good of her citizens, with pure liquid vaccine lymph; and at no very distant day the matter that has been circulating for half a century through a multitude of human systems, and taken after it has dried into a crust, ought to be discountenanced by the profession, if not prohibited by law.

The profession must bear in mind that there is a spurious as well as a genuine vaccine disease—the one giving no protection against smallpox, and the other securing almost complete exemption. The genuine disease may, from slight causes, degenerate into the spurious, giving no constitutional protection whatever; therefore its entire course ought to be watched, and where there is the slightest deviation from the natural, the operation ought to be repeated. We believe there is no greater difficulty in distinguishing the true Jennerian vaccine disease, the lymph of which will protect the system, and is suitable for propagating the protective disease, from the spurious and unreliable, than there is in diagnosing correctly, scarlet fever from measles, or measles from smallpox. But to determine whether a crust contains genuine or spurious vaccine elements, or the seeds of other diseases, is more difficult, if not utterly impossible, unless where you can learn its exact history during every stage of its progress. The true Jennerian vaccine vesicle, from the fifth to the eighth day inclusive, or while the lymph secretion remains clear and transparent, and before the areola forms around it, can yield nothing but genuine vaccine virus. This, too, is the only period of the vaccine disease and condition of the vaccine vesicle from which reliable matter can be taken, or that will produce a full pro-

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tective constitutional impression. The certainty with which we can determine the character of the vaccine disease in its vesicular state, and the facility with which it can be propagated from matter taken at this period, makes it the most favorable time for these purposes. The smallest portion of lymph in a fluid state is sufficient to produce the desired effect, and will not fail once in a hundred times, and is therefore much to be preferred to the best dried lymph or crust when we desire to produce an immediate vaccine impression. When lymph is used directly from the arm, the danger of introducing spurious vaccine matter and other diseases is reduced to its minimum; indeed it is rendered almost an impossibility, as the characteristics which distinguish the true Jennerian vaccine vesicles from the spurious, at this stage, are so well defined that it would be inexcusable for any doctor to mistake them.

It is worthy of remark that a vaccine vesicle of the most perfect character may, on the fifth, sixth, or even seventh day, and even after we have extracted reliable lymph, develop an unhealthy action, which will endanger or defeat protection to the individual, and render the remaining matter unfit for propagating the vaccine. A true Jennerian vesicle, running an entirely regular course, connects with its specific vaccine secretion in drying matters, the product of ulcerative action in the surface layers of the skin. Of course, when the crust is used for propagating the vaccine protection, these different elements cannot be distinguished or separated. Even when we have the finest translucent mahogany-colored crust, it is only the central part that is fit for use, as the lower layer and edge contains, of necessity, these foreign matters. It is notorious that the matter which occasionally exudes from a vaccine crust in process of drying, and which has been regular in every other respect, will excite, if introduced into another person, a pustular inflammation, of considerable severity, at the point of insertion, but without the characteristic vaccine vesicle, and therefore gives no protection against variola. If it were not for the difficulty of preserving or obtaining the fluid lymph when wanted, the crusts, I am quite confident, never would be used by the profession.

I venture to add that no vaccine crust ought to be relied upon for propagating vaccine which the doctor has not watched throughout its various stages of development, maturation, and decline, and of the genuineness of which he is not satisfied. He ought to know that there was at no time the least undue inflammatory or ulcerative action, that the vesicles appeared at the proper time, and

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presented the usual form and appearance; that they contained an abundant secretion of the pearly lymph characteristic of the genuine cowpox; that they remained unbroken and unchanged in color from the fifth to the eighth day before the areola began to form around them; and that the lymph dried up and did not exude from the vesicle; in a word, he ought to be satisfied that the crusts contain the elementary cells essential for propagating a disease preventive of smallpox, and nothing else.

After a pretty full examination of the subject of vaccination, and the best modes of obtaining protection from smallpox, I feel called upon to urge the profession of the United States to adopt the use of the fresh lymph exclusively in vaccinating. I am satisfied that by this method, fewer failures to produce the necessary vaccine impression will occur, and that, at the same time, the quality of the protection will be improved. The modes which have been adopted in Europe for preserving the lymph for a short time, and transmitting it from place to place, is between small pieces of flat glass and upon ivory and quill points, and in Husband's capillary glass tubes. There is, however, no mode of vaccination superior or equal, when it can be arranged, to that of having the person from whom we are to extract the lymph, and the one to be vaccinated, brought to the same house, and then to transfer the vaccine fluid upon the same lancet with which we give it a lodgment in the new patient. In the private practice of physicians in cities and towns there ought to be no difficulty in propagating vaccination in this way. With country practitioners this mode of proceeding will be more difficult of accomplishment; but when the patients cannot be brought together, the lymph should be conveyed and used in a fresh and fluid state.

The mode of introducing the vaccine lymph is not a matter of such entire indifference as is usually supposed. In Europe it is held to be a matter of so much importance that instructions are issued yearly from a central vaccine board to all vaccinators throughout the country, instructing them upon this and other points essential to the success of the practice. The plan I prefer, and generally practise, is by a simple puncture. This I make with an ordinary thumb lancet, introducing the point quite flatly under the scarfskin of the arm, though so superficially as to scarcely draw blood. A similar puncture is made in three several distinct places in each arm, an inch and a half to two inches apart. Having introduced the lymph of a proper character from a healthy subject,

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the punctures are left without dressing. From this mode there results less ulcerative action than when the skin is scarified by a number of transverse incisions, and the papular and resulting vesicles are more regular in form and less likely to be the seat of undue inflammatory action, which, by other modes, not unfrequently prevents vaccine protection.

When this mode of multiplying the vaccine vesicles—which is, in all essentials, the one recommended and adopted in England—has been practised, and good-sized vaccine vesicles have formed at all the points, the physician need have no hesitation in extracting lymph from as many as two or three for the purpose of conveying the prophylactic to others; or should the secretion in two or three of them be destroyed by accident, no apprehension need be experienced, as those remaining will furnish lymph in abundance. I consider it highly important to a complete constitutional saturation with the vaccine element, that at least six good-sized vesicles be obtained in every case. And I consider it equally important that at least three of them should be preserved undisturbed for the action of the absorbents, as less than this number gives but unsatisfactory protection against variola. When, from any accident, all the vesicles get destroyed before the tenth day, the vaccination ought to be repeated, lest a complete constitutional impression may not have been obtained.

The operator must not lose sight of the fact, that constitutional vaccine protection is obtained from the absorption of the specific vaccine secretion, which takes place in each successful case, and not from the matter originally introduced. For instance, if genuine vaccine lymph be inserted into the arm, a perfect vaccine vesicle forms on the fifth day, but if destroyed on the sixth, or before absorption of the vaccine lymph has taken place, no constitutional impression will result. Here the developing process is aborted, and the germ destroyed, so that no more specific secretion can take place, as we have all seen frequently exemplified in the early destruction of a venereal pustule or chancre, which, if done early, effectually prevents its specific constitutional effects. The evidence that absorption of the protective vaccine element has taken place is the establishment of a deep-red areola, extending for an inch or more around the vesicle. But the only reliable evidence we can have that complete vaccine protection has been obtained is by the introduction of fresh vaccine matter.

The importance of producing and preserving two or more vaccine

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vesicles in each case has been thoroughly investigated in Great Britain, where vaccinators are specially directed to obtain not less than from four to six distinct and perfect vesicles.

Mr. Marston, whose experience in smallpox is scarcely equalled by any living practitioner, prepared for Mr. Simon, of the Privy Council, the following information upon this point—the evidence of security or danger to be inferred from the character and number of vaccine cicatrices, derived from data covering six thousand cases of post-vaccinal smallpox, and running through twenty-five years of service in a large smallpox hospital. The facts were tabulated by Mr. Simons, and will be found on page 25 of his *Report on Public Health in Great Britain*, for 1860.

The facts collected by Mr. Marston's industry are so conclusive upon the point under discussion that I am moved to reproduce them here, merely making a slight alteration in the order in which they first appeared and somewhat condensing them.

"*Comparative ratio in which persons vaccinated in different ways will be safe against death from smallpox should they be attacked by it; also the rate of mortality attending the unvaccinated. Cases classified according to number and character of vaccine marks.*

	Deaths per cent.
1. Stated to have been vaccinated, but having no cicatrix . .	21¼
2. Having *one* vaccine cicatrix (*a*)	07½
3. Having *two* vaccine cicatrices (*b*)	04⅛
4. Having *three* vaccine cicatrices	01¾
5. Having four or more vaccine cicatrices	00¾
The unvaccinated	35½

(*a*) Among cases in which the one cicatrix was well marked, the death rate was 4½; among cases in which it was badly marked the death-rate was 12.

(*b*) Among cases in which the two cicatrices were well marked, the death-rate was 2¾; among cases in which they were badly marked it was 7¼."

Thus it will be perceived that among those attacked with smallpox, reported to have been vaccinated, but upon whom no vaccine cicatrix can be observed, about one-fifth die. In those who present one good, well-defined, vaccine cicatrix, only four per cent. die; but when the scar is indistinct, the percentage of mortality rose to twelve in the hundred. When cases presented two well-defined vaccine cicatrices, the deaths scarcely reached three in the hundred; but when there were two, and they but slight, the percentage of mortality rose to seven. In every hundred cases occurring in persons who had three well-marked cicatrices, the average mortality fell below two per cent.; when there were four or more good

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cicatrices, the percentage of deaths from smallpox did not amount to one in the hundred.

These facts are as pointed and conclusive in favor of four or more vesicles as can be wished, and ought to revolutionize the practice of vaccination, as ordinarily conducted in the United States. We seldom produce more than one vesicle, and use almost exclusively the crust which is acknowledged to be inferior to the lymph in propagating vaccine. In Europe, the opinion prevails very generally that one vaccine vesicle cannot be relied upon as affording complete protection against variola. If Mr. Marston's facts are correct, they go far to explain why varioloid is more common and more fatal in the United States than elsewhere; and applying these facts to our own country, it forces us to the inevitable deduction that not fewer than seven, in every hundred persons vaccinated in the mode common with us, are liable to death if attacked by variola. But by inducing, in all cases, from four to six good-sized vaccine vesicles, the liability to death from variola is reduced to less than one per cent. While we regret that the protection in those who have been vaccinated is not as complete as we could wish, yet we have still more to regret that at least one-tenth of our whole population remains without any protection at all, and among them, if attacked with smallpox, from twenty-five to thirty-five deaths in the hundred would occur. We feel impelled, in view of all these facts, to warn the government and the profession of the danger to public health from the want of proper vaccine protection, which has not been and could not well be overstated.

The remaining vaccine cicatrix, although of considerable importance when it is of regular form and of distinct characteristic appearance, cannot still be relied upon as giving a true indication of the degree of vaccine protection the individual may be under at the time. Constitutional peculiarities, with the lapse of time, so restore the receptivity to variola to some individuals, that it is not uncommon for persons having deep scars from casual smallpox, and others bearing satisfactory and typical vaccine cicatrices, to become the victims of fatal attacks of the disease. Therefore, when there is a wide-spread tendency to variola, the doctor should give his patients the benefit of the absolute test, by the introduction of fresh vaccine lymph, unless they have undergone a successful vaccination within five years.

That fresh lymph from a true Jennerian vaccine vesicle has been introduced into the arm of a patient in the mode recom-

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mended, ought not of itself to satisfy the doctor that exemption against variola has been secured. Failures to protect, even when the purest vaccine lymph has been used, are not unfrequent; and it is the vaccinator's duty to detect and remedy any defects. It is as unpardonable for a doctor to fail to protect his patient from smallpox by proper vaccination, as would be any other species of malpractice.

It is the duty of the vaccinator to see that the vaccine runs a regular course, forming on the second day a slight elevation, felt on pressure, and showing, by the aid of a magnifying glass, some redness on the third, and forming a thin transparent vesicle, exceeding the point of insertion on the fifth, elevated at the circumference and depressed somewhat at the centre. The protective vesicle fills with a clear pellucid fluid, which should remain unchanged in color until the eighth day, at which time it attains its highest perfection—is oval in form, and of a beautiful pearl color. At the close of the eighth day the inflamed ring or areola begins to form around the base of the vesicle, extending from one inch and a half to two inches in circumference, causing considerable hardness and swelling of the cellular tissue, reaching its height about the tenth day. During these two days there is generally some constitutional disturbance noticeable, and the glands under the arms usually give evidence that active absorption has been going on. The vesicle, which has gradually become opaque after the eighth day, on the twelfth begins to concrete, and by the fifteenth is formed into a fine crust or scab, which usually falls off by the twenty-first. The success in giving vaccine protection depends chiefly upon the regularity, quantity, and quality of the true Jennerian vaccine secretion, left to the undisturbed action of the absorbents.

The age of the individual does not seem to exercise any perceptible influence over the degree of protection gained. The uniform mildness of the disease justifies the practice at any age and at any season. Prudence, however, suggests to the physician to vaccinate infants between the first and the fourth month, or before teething has commenced. I have, on three several occasions, when there was smallpox in the house, and when exposure could not be avoided, vaccinated the infant immediately after it was washed and dressed. In no instance did this prove unfavorable to the health of the child, nor did the vaccina deviate in the slightest degree from the regular course. With ordinary care, the season of the year, as I have in-

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timated, will exercise no unfavorable influence upon the production of the true vaccine impression. The amount of clothing worn in this climate in the winter season, from its weight and friction, endangers somewhat the safety of the vaccine vesicles, and to the extreme heat of summer there is also some objection, from the profusion and irritating effects of perspiration, which sometimes induces inflammatory action, destroying thereby the specific and protective character of the vaccine secretion before it has been absorbed or has produced its constitutional impression.

When, however, the circumstances of parents are such that these slightly embarrassing conditions can be watched and controlled, the operation need not be delayed on account of the season.

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REPORT

OF THE

COMMITTEE ON THE INTRODUCTION OF DISEASE BY COMMERCE,

AND THE

MEANS FOR ITS PREVENTION.

BY

A. N. BELL, M. D.,

BROOKLYN, N. Y.

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REPORT OF THE COMMITTEE ON THE INTRODUCTION OF DISEASE BY COMMERCE, AND THE MEANS FOR ITS PREVENTION.

THE migratory nature of epidemic diseases, which has so often been compared to that of certain insects or birds, will, upon examination, be found to be based upon fancy rather than fact; that there is, in general, no such adaptation of the same epidemic to far different, however distant, localities.

Diseases which in the days of Viscount Bernabo were supposed to be erratic, and constantly on a voyage of discovery for some new port of entry where his vigils were not kept, under the present advanced state of medical and meteorological science are known to have spread from their usual habitations only under the most favorable auspices, and to such places as were characterized by conditions closely resembling those in which they had been domiciled. These conditions may be regarded as the remote causes of disease, and are, in general, immutable; and wherever these causes habitually exist, there, of all places, are exciting causes most likely to usher in epidemics. When epidemics are thus once planted, their diffusion by atmospheric agencies is co-extensive with the locality and the duration of favorable climatic conditions.

In order to form correct conclusions on the etiology of epidemic diseases, it is necessary that we measure the scope of our inquiries by their prevalence in numerous places and under apparently different circumstances.

As a starting-point, it may be stated as a truism that the three great epidemic diseases, plague, cholera, and yellow fever, are ordinarily to be found in their greatest intensity, at certain seasons, at the three great deltas of the Nile, Ganges, and Mississippi.

These places have certain attributes in common. Great beds of alluvium, filled with the organic remains of plants and animals festering under a tropical sun, constitute sources of disease varying

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in intensity with meteorological cycles and population. In all alike, too, at certain seasons, when these climates bear the greatest resemblance to each other, malarious diseases of the same type—intermittent, remittent, and bilious fevers, diarrhœa, dysentery, and hepatic derangements—prevail.

Their *different* attributes appear in the natural history of the regions whence these *sunderbunds*[1] are collected. That the lees and slime from the table-lands of Abyssinia and the adjacent country of the tributaries of the Nile, which have for thousands of years been accumulating in the lap of Egypt, should possess attributes different from the Himalayan snow-waters of the Ganges and its congeries, which, on reaching the Hoogly, are consecrated by being made the depository of the dead, is no less reasonable than probable. Then, again, of the Mississippi delta. The interminable swamps of Northern Minnesota, spreading out and finally uniting in a sluggish stream, which for the first three hundred miles of its course can scarcely be regarded as anything more than an extensive marsh drain, that for more than a thousand miles further on is fed by numerous tributaries from limestone bluffs, and finally swallows up the great streams which drain the Rocky Mountains on the one side and the Alleghanies on the other, containing the gleanings of a river plateau unequalled elsewhere in the world—that such a body of water, from such an area, should contain material of different attributes, in relation to disease, from the Nile and the Ganges, is, to say the least, highly probable.

But there are other differences more manifest—the different meteorological conditions, and the different habits of the people.

Meteorology is no longer the vague and uncertain science that it was during the time of the great epidemics of the middle ages; and, like other advanced sciences, while it lights up the future with new rays of hope, it reflects upon the past. Humboldt, with his accustomed sagacity, has remarked that the most favorable cause for the development of epidemics is to be found in a uniform and long-continued type of meteorological phenomena. For example, in the case of the plague, it is after a lengthened duration of the same temperature and of the same winds that the pestilence in an epidemic form has been observed to break out in Egypt, Syria, and Constantinople.

[1] The delta of the Ganges extends over an area of three hundred by two hundred miles, composed of low alluvial islands and marsh, covered with underwood named *sundry*, whence the tract is called *sunderbunds*.

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It may be readily believed that when a population has lived for a lengthy period of time in the same condition of climate and alimentation, the system of each individual becomes profoundly modified in the same manner, and may be disposed to receive, or even develop spontaneously, the same disease.

The water of the Nile, for six months in the year, is so thick that it must have time to settle before it can be drunk; and, at all times, people of delicacy have to perfume and cool it by evaporation before drinking, while in no country in the world is so much water used as in Egypt. The first thing an Egyptian does on entering a house is to take a hearty drink of water. Towards the end of the hot season, in February, the *kamsin* begins to blow. This lasts about fifty days, blowing in intervals of not more than three days at a time. During the *kamsin*, the atmosphere, which is at other times clear, becomes so loaded with dust as to be almost dark; dust penetrates everywhere, and all nature is dried up by the intolerable heat. The skin becomes exhausted of perspiration, and is parched almost to a crisp. Respiration is oppressed, and intolerable thirst seems to threaten the very existence of life. In June the inundation begins, and ends in September, sometimes a little earlier or later, and the plague always varies in the same degree. It arises as the Nile subsides, and prevails until the following June, when its ravages cease and remain in abeyance during the season of intense heat, to be again called into existence in the autumn.

In Upper Egypt, where the waters of the Nile are confined between its banks, and where the soil is of a stable nature, the climate is salubrious. In certain other parts, where the soil is argillaceous and subject to inundation, instead of plague, intermittent and remittent fevers prevail in their most malignant forms. The habits of the Egyptians, all observers concur in describing as filthy in the extreme. They live in small, damp, closely-crowded huts, thick with the odors of their own personal impurities mixed with those of the heated marshes; and here cook their scanty stale meats and fish, over fires made of dried manure. Ignorance, despotism, and poverty combine to make them in all respects a degraded people.

The hygienic conditions of other prominent localities with which the plague is identified in history will, almost without exception, be found to bear some resemblance to those of the delta of the Nile. At Constantinople, as at Cairo, before the plague ceased to be almost an annual epidemic, the filth of its environs was intolerable,

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and disgusting in the extreme. And with the annual setting in of the *sirocco*, when the putrefaction of all organic matters was most active, the pestilence generally made its appearance. The same is the case with Erzeroum.

At Moldavia and Wallachia, on the Danube, the poorer classes are known to live in the greatest misery and filth, and in both of these places, after the excessive heats of summer, malignant intermittent and remittent fevers generally prevail, and are succeeded by plague. And the same is the case with the plague-spots of Syria and other plague countries of the present day, no less than it was with London in the seventeenth century.

For more than a thousand years after the Christian era, great calamities of famine and pestilence are constantly recorded as prominent features of the times. They were both owing to the same cause—*excessive rains and inundations, followed by drought and high temperature.* The plague is known to have advanced from the confines of China, across Thibet and Persia, to Southern Russia, and thence spread itself over almost every country in Europe. But there went before it great floods and torrents, causing such inundations in the valleys as had never been heard of before. Italy, Sicily, Cyprus, Spain, Germany, Holland, England and Ireland all were deluged and heated by a cycle of meteorological conditions no less rare in its visitations than the plague which followed in its train.

In 1592 there was such a drought in England that the Thames was fordable, and the autumn was exceedingly sultry. It was followed by plague. Seventy years later, the same meteorological conditions in Spain and Portugal were also followed by the plague. And the great plague of London, in 1665–6, was, it is well known, preceded by an unusually wet winter, early spring, and an excessively hot and long summer.

In 1844 the Royal Academy of Medicine in France appointed a commission to examine all the varied questions connected with plague and quarantines. This commission was composed of MM. Adelon, Begin, Dubois, Dupuy, Ferrus, Londe, Melier, Pariset, Poiseuille, Prus, and Royer-Collard, all men of the highest professional and scientific attainments. The commissioners were engaged in their deliberations for over a year, and had every facility granted them by the French government, to render their inquiry complete and accurate. At length their report was drawn up and presented

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to the Academy. Among the most important of their conclusions are the following:—

"The plague has been observed to arise spontaneously, not only in Egypt, Syria, and Turkey, but also in many other countries of Africa, Asia, and Europe."

"In all countries where the spontaneous plague has been observed, its development may be reasonably attributed to certain determinate conditions acting upon a large portion of the inhabitants. The principal of these conditions are, residence upon marshy alluvial soils near the Mediterranean, or near certain rivers, as the Nile, Euphrates and Danube; the dwellings being low, crowded, and badly ventilated; a warm and moist atmosphere; the action of putrescent animal and vegetable matters; unwholesome and insufficient food; and great physical and moral wretchedness."

"All the producing causes of the plague being found united in Lower Egypt, the disease is endemic in that country, where it is seen every year in the sporadic, and about every tenth year in the epidemic form."

"The plague, abstractedly from the influence which the infected may exercise, spreads itself after the manner of most epidemic diseases, viz., by the action of general causes."

In reply to the question, "*Is the plague transmissible by inoculation either of the blood drawn from a vein, or of the pus from a bubo, or of the serosity from the phlyctena of a carbuncle?*" M. Prus observes that "it is obvious that if the plague be truly a virulent disease (*à virus fixe*), the possibility of the inoculation of its virus would approximate it to epidemic contagious diseases; whereas if it does not furnish any principle, liquid or solid, that is susceptible of being inoculated and of producing a virus similar to that which gave it birth, the disease must be withdrawn from the class of diseases that are properly contagious, such as smallpox, and would approach, in this respect, the character of typhus, which is propagated by peculiar miasms, but which gives out no inoculable element."

The *conclusion* of the commissioners upon this important point was, that "the results of the inoculation of the blood drawn from the vein of a plague patient, or from the pus of a pestilential bubo, have been equivocal; the inoculation of the serosity taken from the phlyctenæ of a pestilential carbuncle has never given the disease. It is, therefore, not proved that the plague can be transmitted by inoculation, even under the influence of a pestilential constitution."

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On the one hand, immediate contact with thousands of plague patients has not been followed by any dangerous consequences to those who have been exposed to it in the open air, or in well-ventilated chambers; and on the other, that there is not a single fact which indisputably proves the transmissibility of the plague by mere contact with the sick."

"Very numerous facts prove that the clothes and effects belonging to plague patients have not communicated plague to persons who have used them, even without any previous purification. The facts which seem to indicate an opposite result can only be considered valuable, if they are confirmed by fresh observations made beyond epidemic *foci*, at a distance alike from *foci* of miasmatic infection, and from countries where the plague is endemic."

"*In epidemic foci* the plague is transmissible by the miasms which emanate from the bodies of the infected, and by the foci of infection thereby produced."

"It is indisputable that the plague is transmissible beyond or away from epidemic foci, whether on board vessels at sea, or in the lazarettos of Europe."

"There is nothing to prove that articles of merchandise can transport the disease beyond epidemic foci."

"The transmission of the plague by pestilential miasms is a proved fact."

"The transmission of plague by immediate contact with the infected is not a proved fact."

"If it has been proved that the existence of a pestilential constitution in a country into which the plague is imported, is necessary for the transmission and propagation of the disease, it seems nevertheless certain that imported plague will not exercise any great ravages if it does not meet, in the character of the climate, atmosphere, and population of the place, with the conditions that are favorable for its development."

CHOLERA.—Since the year 1832, when the cholera may be said to have commenced a tour of the world, it has never wanted for historians, nor have these wanted for disinterested readers. Every possible modification has been delineated and recounted with a prolixity and minuteness only to be accounted for, by its menacing attitude to each individual writer. Known to be endemical in India by the most ancient historians of that country at all times, and to have been described by the ancient authors of other coun-

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tries and places combining the localizing causes and meteorological conditions more or less similar to those of the delta of the Ganges, it is not deemed necessary to go extensively into its history. It will suffice to state that, according to the testimony of all observers, its chief predisposing causes are animal and vegetable matters in a state of decomposition, dampness, moisture, filth, high temperature, and crowded, ill-ventilated apartments. That it is most virulent in low-lying districts, on the banks of rivers, in the neighborhood of sewer mouths, and wherever there are large collections of refuse, particularly amidst human dwellings that are thus situated. That such conditions as these predispose to epidemics of every kind, in no respect vitiates their application to cholera. It may not be, it *is not* within our power to point out what the peculiarity of the climatological cause is that so constantly exists at the delta of the Ganges as to excite cholera there in consequence of the peculiar local causes so greatly intensified; nor is our chemical knowledge equal to the task of pointing out from analysis why a different result should be obtained by the climatological and local influences of the Ganges from those of the Nile. Such, however, is the fact, and as such we are obliged to admit it. And so, too, in regard to the meteorological conditions which precede or accompany cholera in unusual places. Our inability to appreciate chemically the influence of the still, heavy air, which so generally prevails just before or during cholera epidemics, in its peculiar effect upon localizing causes, is precisely analogous to the same differences on a large scale, as at the deltas. We are forced to accept the result as a demonstration of different properties. Wherever this state of climatological influences exist together with the localizing causes predisposing to cholera, there is a *foci* of the disease, where it is more liable to originate spontaneously than to receive it from other places. No one, however, can question, in view of all the facts that have been elicited in the history of cholera, that into such a place cholera may be introduced. John Simon, Esq., in his Annual Report to the City Commissioners of Sewers, of London, 1854, whilst he appears to consider the introduction of a ferment from without to be requisite for the production of cholera, says: "The specific migrating power, whatever its nature, has the faculty of infecting districts in a manner detrimental to life, *only when their atmosphere is fraught with certain products susceptible, under its influence, of undergoing poisonous transformation.* . . . Through the unpolluted atmosphere of cleanly districts it migrates silently without a blow; that which

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it can kindle into poison lies not there. To the foul damp breath of low-lying cities it comes like a spark to powder. Here is contained that which it can quickly make destructive—soaked into soil, stagnant in water, griming the pavement, tainting the air—the slow rottenness of unremoved excrement to which the first contact of this foreign ferment brings the occasion of changing into new and more deadly combinations."

YELLOW FEVER.—It is unnecessary for the purpose of this paper to discuss whether yellow fever was first discovered in America, or originally imported into it. We know from the history of the times that, in the latter half of the seventeenth century, when England was moved to the adoption of quarantine regulations for keeping out the plague while she was nursing it at home, her colonists in America were similarly exercised in regard to a *new* plague in the West Indies.

Among the attributes of patriotism, the defence of one's home is everywhere an acknowledged virtue. And it is perhaps no disparagement to medical men generally, that they are too apt to exert themselves to show that diseases originating in their own neighborhoods have had their origin elsewhere. "In all climates," says Humboldt, "men imagine they find some consolation in the idea that a disease reputed pestilential is of foreign origin. As malignant fevers are easily engendered amid a large crew, heaped up in filthy vessels, the commencement of an epidemic dates pretty often from the arrival of a squadron. Then, instead of attributing the evil to the vitiated air contained in vessels deprived of ventilation, or to the effect of a hot and unhealthy climate on newly-arrived sailors, people affirm that it has been imported from a neighboring port, where the vessels in the convoy have touched, on the passage from Europe to America. It is thus that we often hear it said in Mexico that the vessel of war, in which such a viceroy has arrived in Vera Cruz, has introduced the yellow fever, which had ceased to reign for some years past; it is thus that during the hot season, Havana, Vera Cruz, and the ports of the United States mutually accuse each other of being the source of the disease by which they are visited."[1]

The history of yellow fever is contemporary with certain com-

[1] Essai Politique sur le Roy. de la Nouv. Esp. La Roche on Yellow Fever, vol. ii. p. 200.

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mercial ports in America. That in numerous instances it has been introduced by shipping, in which it has originated spontaneously, or been transported in the material of commerce from other places cannot be questioned by any one who will take the pains to become acquainted with its history. Everywhere, however, in its origin, extension and limitation, it is circumscribed by localizing causes and meteorological influences, such as exist in their greatest intensity, at certain seasons, at the delta of the Mississippi. These are localizing influences more or less approximating to those of this great delta, and a range of about 80° temperature for several weeks or months.

In *every locality where the yellow fever is endemic, arises spontaneously*, or *is capable of being introduced*, the thermometer gives us an average heat of about 80°, usually characterized by great steadiness of temperature day and night.—It would be useless to extend this paper by a category of the places at which yellow fever is wont to prevail, according to the conditions of the delta of the Mississippi. For details, refer to the great work of La Roche on Yellow Fever, which is replete with data illustrative of the ground here taken.

Since yellow fever appeared in the Brazils, about sixteen years ago, it has extended over the entire Gulf of Mexico, the West Indies, and to most of the southern States, and finally to the Pacific Coast. But all the while it has clung with remarkable tenacity to regions and localities remarkable for general resemblance, for the time being, at least, in local and climatological conditions.

In 1851-2, it is well known, the harbor of Rio Janeiro was crowded with infected vessels, many of them destined for the Pacific. How many of them arrived there still infected, and touched at places where yellow fever soon after, for the first time, prevailed, we have no means of knowing. But a few have been traced. About the middle of the year 1851, the steamer "New World," on her way to California, touched at Callao, after having lost almost her whole crew by yellow fever in Rio. The steamer "Quito" also, during the same season, lost several of her crew, proceeded to the Pacific, and arrived at Callao in April, 1852. The first German emigrant ships arrived in Callao in December, 1851. During the early part of the year 1852, a mild form of fever broke out in Lima, and along the coast of Peru, which the natives called "pelusa," just as, in 1849, the precursory form of fever which prevailed at Rio was called "polka." From this nucleus the disease speedily

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developed itself into a perfect type of yellow fever, and has become domiciled.

June 6, 1855, the steamer "Ben Franklin" arrived at Norfolk from St. Thomas, where she had been several months during the prevalence of yellow fever, and had lost several of her crew with the disease, and had also lost two or three on the voyage to Norfolk. But at the time of her arrival she had no one on board sick with it.

On the 5th day of July a man, who had been working on the boiler of the "Ben Franklin" two days before, was taken with the fever and died on the fourth day of the disease. This was the starting-point of the fever which subsequently prevailed so extensively at Portsmouth and Norfolk.

In October, 1857, the U. S. Steamer "Susquehanna" was ordered from Spezzia to San Juan de Nicaragua, where she arrived early in December; having touched by the way at Genoa, Madeira, and Key West. She remained at San Juan until the first of the following April, having had during the whole period of time she laid there a constantly enlarging sick list of a precursory fever. At first intermittent, then remittent, but all recovering until the 20th of March, when a case became malignant and died.

The ship put to sea April 1st, and on the 5th arrived off Port Royal, Jamaica, with one hundred and six officers and men down with yellow fever. Most of these were sent to the hospital, and on the third day afterwards, she sailed for New York, where she arrived on the 15th with fifty on the sick list.

The remarkable feature in this instance is, that at San Juan, where the yellow fever first appeared on board the "Susquehanna" *spontaneously*, there was no yellow fever, and the disease has never been known to occur there. It was, doubtless, very fortunate for the place that the "Susquehanna" left so soon. The circumstance is an example of the peculiar liability of a ship, even above the most favorable conditions of shore, for the spontaneous origin of the disease. The same thing has been exemplified in numerous instances. Indeed, there is good reason to believe that the pent-up condition of a ship's crew in a climate predisposing to yellow fever, or any other epidemic disease, increases the danger independently of the still air confined between decks.

The above examples illustrate alike the conditions of spontaneous origin, transportation, and introduction of yellow fever. Other examples might be cited, but they are deemed unnecessary.

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TYPHUS.—This disease differs remarkably from all of the others considered, as regards temperature. It is but little known, and incapable of being introduced, under either extreme of temperature, except under long-continued defective medical police. Where the mean annual temperature rises above 62° or falls below 40°, typhus fever rarely prevails. And a continued temperature for a length of time above or below these extremes, generally puts a stop to its progress. As an epidemic of the British Isles it is prone to arise from the mere accumulation of the effluvia given off from the human body, whenever masses of people are long crowded together in a narrow space, while cleanliness and ventilation are at the same time neglected. Hence it is frequently present in crowded prisons, badly constructed hospitals, and emigrant ships. The risk of infection from typhus is, *cæteris paribus*, almost exactly proportionate to the impurity of the air—the cause which gives rise to it—and the disease seldom or never spreads when the sick are removed from the original *habitat* of the evil, and placed in clean and airy dwellings. It is capable of spontaneous origin, of being transported and of being introduced into new places on the same conditions as plague, cholera, and yellow fever, respectively, viz., under those circumstances and into those localities which are capable of producing the disease. That typhus owes its existence to the joint influence of certain localizing causes and meteorological conditions appears to be no less certainly the case than that of plague, cholera, and yellow fever. Indeed, if it were possible to apply the meteorological conditions of any one of these diseases to the localizing causes of the other, it seems to be probable that one could be changed for the other. And that, therefore, the conclusions of the French commission in regard to plague, are equally applicable to cholera, yellow fever, and typhus, excepting only the meteorological conditions of origin.

In concluding this inquiry into the localizing causes and meteorological influences governing the introduction of disease by commerce, the indications for its prevention are manifest.

In regard to certain regions and places of great magnitude, where the causes and conditions of epidemics are indigenous, or have become thoroughly acclimated, there appears, indeed, to be but one remedy, viz., keep as clear of such places during the dangerous season as possible. But in regard to other localities, where any of the conditions are artificial, our duty is clear—attack the

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removable causes, *do away with epidemic foci*, on the one hand by civic cleanliness; and prevent the introduction of disease on the other, by *disinfection*. To enter into these secondary questions, *seriatim*, it is evident would extend this paper to an inordinate length.

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REPORT OF THE SECTION

ON

Surgery.

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REPORT OF THE SECTION

ON

SURGERY.

TUESDAY, June 6, 1865.

THE Section on Surgery met in the Green Room at half-past three o'clock, and organized with the choice of Dr. HENRY J. BIGELOW, of Boston, as Chairman, and Dr. ADINO B. HALL, of Boston, as Secretary. The attendance of gentlemen interested in surgery was quite large.

Dr. J. MASON WARREN, of Boston, read an elaborate paper on *Staphyloraphy*. Considerable discussion followed.

Dr. GARRISH, of New York, asked if Dr. WARREN had used sutures of silver wire. He had employed them in this operation, and, he believed, with advantage.

Dr. WARREN had not used wire of any kind in this operation, although Dieffenbach had formerly insisted strongly upon the very great advantage offered by lead wire over silk or other materials commonly employed for sutures. His own results, amounting to over ninety per cent. of satisfactory union to less than ten per cent. of failures, and the still more striking success reported by Mr. Fergusson in his operations as performed chiefly for fissure in the soft palate, were, in his opinion, a sufficient reason for still preferring silk sutures to the less convenient wires, whether of lead, silver, or iron.

Dr. SAYRE, of New York, thought that silver wire was no better than silk as a material for sutures, while the greater difficulty of removing stitches must be regarded as an important objection to its use in operations for cleft palate.

Dr. MARCH, of Albany, New York, had given wire sutures an extended trial in a great variety of operations, but had of late pretty much given them up, as, on the whole, offering no particular advantages over silk or linen threads.

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Dr. GARRISH spoke of the difficulty he had experienced in holding the tongue. He had used a spatula for this purpose, and had even drawn the tongue out of the mouth by means of a string passed through it near its point.

Dr. WARREN had also experienced the same difficulty, but had generally overcome it by patience, without the use of violent means or of any of the various spatulæ which have been recommended.

Dr. GARRISH had, in an operation on the hard palate, tried, with apparent advantage, the plan of making long lateral incisions parallel to the alveolar processes. He had, however, been troubled by pretty free bleeding.

Dr. MCARTHUR, of Joliet, Illinois, asked whether it is easy or difficult to peel up the membranes from the roof of the mouth.

Dr. WARREN replied that it is often quite difficult to commence the dissection at the edges of the fissure, but that it becomes very easy after the separation has been effected to the extent of a few lines in the direction of the alveolar processes.

Dr. CAREY, of Salem, Ohio, asked whether, in an adult with hare-lip and cleft palate, it would be preferable to operate first upon the palate or upon the lip.

Dr. WARREN said, upon the palate first, by all means, as in that case the surgeon will have much more room to work upon the deeply-seated parts at the sides and back of the throat. In the case of a young child, he would operate at once upon the lip, and defer the palate-operation until a later period of life.

On motion, the paper was referred to the Committee of Publication.

Dr. LEWIS A. SAYRE, of New York, read a paper on the *Mechanical Treatment of Chronic Inflammation of the Joints of the Lower Extremities*, with a description of some new apparatus for producing extension at the knee- and ankle-joints.

After some interrogatories in regard to the application of the apparatus, the paper was referred to the Committee of Publication.

Dr. SAYRE also read the *History of a Case of Exsection of the Wrist-Joint*, by Dr. TEWKSBURY, of Portland, Me. As this paper was considered as an appendix to the report of the Chairman on conservative surgery, it was referred to that Committee.

Dr. H. D. HOLTON, of Putney, Vermont, read a short paper on *Dislocation of the Sternal End of the Clavicle*, and exhibited a new apparatus for maintaining the reduction.

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On motion, this paper was referred to the Committee of Publication.

A paper was presented from Dr. LAURENCE TURNBULL, of Philadelphia, on *Foreign Bodies in the Ear*, with a condensed statement of the present condition of aural surgery; and a bibliography.

As the author was not present, the paper was referred to the Committee of Publication, with discretionary power.

There being no further business, the Section adjourned, to meet at the Medical College in North Grove Street, at 4 o'clock P. M. to-morrow (Wednesday), to hear a lecture from the Chairman, Dr. H. J. BIGELOW.

A. B. HALL, Secretary.

WEDNESDAY, June 7, 1865.

Agreeably to adjournment, a very large number of delegates assembled in the lecture-room of the college.

Dr. BIGELOW gave a very interesting lecture on fracture of the neck of the femur, and impaction of the head of the bone, and dislocation of the same; with illustrations of the anatomy of the parts, and methods of reduction, as exemplified on the dead subject.

Subsequently, Dr. SAYRE, of New York, offered the following resolution:—

Resolved, That the thanks of this Section are due to Dr. H. J. BIGELOW for his scientific demonstration of the anatomy of the hip-joint and the injuries connected therewith, and their proper treatment, and that they request Dr. BIGELOW to furnish the same for publication.

Dr. WILLIAMS, of Cincinnati, Ohio, presented a paper on *Ophthalmic Surgery*, which was referred by the Association to the chairman and secretary of the Surgical Section. Subsequently it was referred to the Committee of Publication.

The following subjects were selected to be reported upon at the next annual meeting: On Strangulated Hernia, by Dr. PECK, of Iowa; On the Cause and Pathology of Pyæmia, by Dr. J. J. WOODWARD, U. S. A.; On the Use of Plaster of Paris in Surgery, by Dr. JAMES L. LITTLE, of New York.

Adjourned.

A. B. HALL, Secretary.

A number of gentlemen met in the Surgical Section on Wednesday afternoon, and, in the absence of the proper officers, Dr. WM.

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B. ATKINSON, of Philadelphia, Pennsylvania, was requested to preside, and Dr. J. S. GREENE, of Dorchester, Massachusetts, was chosen Secretary.

By request, Dr. BENJ. HASKELL, of Rockport, Massachusetts, read his paper entitled *Remarks on the Experiments and Observations of Bell, Mayo, and others, on which the Doctrine of Sensitive and Motor Nerves was chiefly founded.*

On motion, the paper was referred to the Committee of Publication.

J. S. GREENE, Secretary *pro tem.*

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FISSURE OF THE SOFT AND HARD PALATE.

BY

J. MASON WARREN, M. D.,

BOSTON, MASSACHUSETTS.

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FISSURE OF THE SOFT AND HARD PALATE.

In April, 1843, I published in the *New England Quarterly Journal of Medicine and Surgery*, an account of a new operation for the closure of fissures in the hard palate, together with a very important modification of the operation of staphyloraphy as practised for the relief of fissures of the soft palate. The operation upon the hard palate (I quote from the description of my first case as reported at that time) consisted in "dissecting up, with a long, double-edged knife, curved on its flat side, the membrane covering the hard palate, pursuing the dissection quite back to the root of the alveolar processes. By this procedure, which was not effected without considerable difficulty, the membrane seemed gradually to unfold itself, and could be easily drawn across the very wide fissure. A narrow slip was now removed from the edges of the soft palate, and with it the two halves of the uvula. By this means a continuous flap was obtained, beginning at the roots of the [incisor] teeth, and extending backwards to the edge of the velum palati. Finally, six sutures were introduced, on tying of which the whole fissure was obliterated. * * * * This patient returned home into the country at the end of three weeks, a firm, fleshy palate being formed behind, and half the fissure in the bony palate obliterated. In the following spring, I again operated on the remaining fissure in the hard palate, and succeeded in closing half the extent of it, the tissues yielding with some difficulty, owing to the inflammation caused by the former operation. The small aperture which remained, I directed to be closed by a gold plate." I had at this time operated in this manner in fourteen different cases, "which, with one exception, had terminated successfully, either in the closure of the whole fissure of both hard and soft palate, or so far that the aperture which remained in the bones could be easily closed by an obturator fitted to the adjoining teeth."

The improvement to which I have alluded in the operation upon

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the soft palate, consisted in the relaxation of the tissues of the fissured velum by means of incisions, made with strong curved scissors, so as to divide the attachments of the soft palate to the tonsil and to the posterior pillar, or, in other words, dividing the posterior pillar of the palate just where it begins to spread out into the velum. The effect of this incision is at once seen in the almost complete relaxation of the parts, so as to admit of their easy approximation and union by suture. At this time I had met with no case in which this procedure failed to relax the parts, as I thought, sufficiently for the requirements of the operation, and in the fourteen cases of operation for complicated cleft palate which I had then performed, I had met with but one unsuccessful result. In subsequent operations, however, I found that there existed, in some cases, an additional obstacle to the approximation of the flaps, which could be overcome as easily and in the same manner as the former. This obstacle consists of a band of firm tissue extending above and behind the soft palate, and standing out in bold relief when that organ is put on the stretch by drawing upon it with the forceps. This resisting mass, like the other, I have always divided by an additional stroke or two with the scissors whenever the incision of the posterior pillar and adjacent mucous membrane has seemed insufficient properly to relax the palate. By this division of all the parts which oppose any active resistance to the approximation of the sides of the fissure, the operation, as I have performed it, was finally perfected in its essential features; and since that time I have known of no important improvements in it except in a few matters of operative detail. During the past few years, however, I have generally abstained from the attempt to effect the entire closure of very extensive fissures in the hard palate, owing in part to the severity of the operation, but chiefly to the fact that modern improvements in mechanical dentistry have furnished us with a most efficient and comfortable substitute for the natural hard palate, in the form of a metallic or hard rubber plate.

To complete the history of the operation as originally performed by me, I will again quote from the same paper the description of the method of operating.

Operation.—"The patient is placed on a low seat, in a strong light, his head firmly supported on the breast of an assistant, who raises or depresses it, as circumstances may require. He is directed to keep the jaws widely separated, to retain any blood which may

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collect as long as possible, so as not to embarrass the operator, and to restrain all efforts at coughing. To do this will require constant warnings and encouragement on the part of the surgeon, as there is a natural tendency to close the mouth as soon as any pain is felt, or there arises any collection of blood or mucus in the fauces which interferes with respiration. The use of a speculum, as directed by some operators, is altogether inadmissible; it not only obscures the light, but also prevents the proper manœuvres of the instruments. The mucous membrane of the hard palate is now to be carefully separated from the bones with a long double-edged bistoury, curved on its flat side, and is rather *peeled* than dissected off, from the difficulty of making any sawing motion with the knife in this confined situation, the obstacles always being greater in proportion to the obliquity of the palatine vault. As the dissection approaches to the connection of the soft parts with the edges of the ossa palati, where the muscles are attached and the union most intimate, great care must be taken or the mucous membrane will be perforated. From these causes, I have found this part of the operation to be the most embarrassing. As soon as this dissection is terminated, it will generally be found that, by seizing the soft palate with the forceps, it can be easily brought to the median line. If the fissure is wide, and this cannot be effected, I have found the following course to be invariably followed by success. The soft parts being forcibly stretched, a pair of long, powerful, French scissors, curved on the flat side, are carried behind the anterior pillars of the palate; its attachments [that is, the attachments of the palate] to the tonsil and to the posterior pillar are now to be carefully cut away, on which the anterior soft parts will at once be found to expand, and an ample flap be provided for all desirable purposes.[1] The edges of the palate may now be made into a raw surface by seizing them upon either side with a hooked forceps, and removing a slip with the scissors or a sharp-pointed bistoury. Our next object is to insert the ligatures, and for this purpose an immense armory of instruments has been invented. After the trial of nearly all of them, I have found the most simple to be the most effectual. A small curved needle being armed with a strong silk thread, confined in a forceps with a movable slide, is introduced to the upper edge of the fissure, the needle being carried

[1] In Mr. Ferguson's elaborate essay on cleft palate, in vol. xxiii. of the Medico-Chirurgical Transactions, the description of this stage of the operation is incorrectly quoted, so as to give an entirely erroneous idea of the nature of the incisions.

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from before backwards on the left side, and from behind forwards on the right, or *vice versa*. In this manner, three, four, or more ligatures may be successively introduced. The patient is now requested to clear his throat of mucus and blood, the ligatures are wiped dry and waxed, and tied with deliberation, beginning at the upper and proceeding gradually downwards, waiting a little after each ligature, in order to allow the throat to accommodate itself to this sudden and almost insupportable tension of the soft parts. No forceps are required for holding the first knot while the second is tied; the object is better effected by using the surgeon's knot—that is, by making two turns of the thread instead of one—and by enjoining perfect quiet on the patient for the moment, until the second knot is tied. It has been advised by some surgeons to wait a certain length of time, after the cutting part of the operation, before inserting the ligatures—five or six hours, for instance—to allow all bleeding from the wound to cease. This appears to me a useless prolonging of the patient's suffering, and entirely unnecessary. I have never seen, in a single instance, either in the operations of surgeons abroad, or in my own experience, any hemorrhage that a little iced water, or the pressure for a short period with the finger, would not easily arrest."[1]

By the introduction of these improvements in the plan and methods of operating, the surgery of cleft palate at once acquired a new and vastly-enlarged importance. The operation of staphyloraphy, as invented by Roux, and practised by many surgeons both in Europe and America, had been considered applicable only to simple fissures of the velum, a class of cases constituting but a very small fraction of the total number of cleft palates, and the very ones in which the need of surgical aid is least urgent.[2]

The highly successful results, however, which I was enabled to

[1] New England Quarterly Journal of Medicine and Surgery, Boston, April, 1843, vol. i. pp. 538–47.

[2] It is true that Roux had occasionally operated to close the posterior extremity of the more extensive fissures by cutting away the velum from the ossa palati, thus leaving the wide fissure in the bones wholly unrelieved; and Krimer had once transplanted flaps of inverted mucous membrane to fill the hole left after an operation for staphyloraphy. Still these plans did not prove to be of sufficient value to lead to their general adoption, and the severer forms of cleft palate, comprising the great majority of actual cases, were uniformly left untreated, as being too unpromising to justify operative interference. The few attempts, whether successful or otherwise, which had previously been made to close openings caused by wounds, or by syphilitic or other disease of the hard palate, are certainly not to be included in the same category with operations for congenital cleft palate.

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report in the treatment of cases which had previously been considered as beyond the aid of surgery, together with the encouraging success which had been already attained by Roux, Dieffenbach, and many other surgeons, from the operation in the soft palate, soon excited the renewed interest of the profession in this most distressing deformity.

An important improvement in the original operation of Roux had been already introduced by Professor Dieffenbach, of Berlin. It consisted in relieving the often dangerous tension upon the stitches by means of deep linear incisions, one on each side of and parallel with the line of suture, and about half an inch distant from it, thereby completely transfixing and dividing all the layers of the soft palate. These incisions immediately gape so as to take the form of oval clefts, and the tightly-strained velum becomes loose and flaccid, "like a wet curtain."[1]

Professor Pancoast, of Philadelphia, had also adopted the same incisions in a case upon which he had operated at the Philadelphia Hospital in February, 1841, "in order to enable the two halves of the velum to come together in the middle line, as well as to divide the insertion of the palate muscles, so as to prevent their straining the sutured edges of the palate asunder."[2] This method has also been adopted by Mr. Pollock, of London, and by Professor Sédillot, of Strasburg, who have shown that the levator palati muscle may be thus divided by a cut of less than half an inch in length. In this way the gaping of the incisions, which is described as taking place in the operation as performed by Dieffenbach, may be almost wholly prevented, although no particular inconvenience seems to result from its occurrence.[3]

Shortly after the publication of my paper, Mr. Fergusson, the distinguished professor of surgery in King's College, London, took up the study of the anatomy and pathology of cleft palate, the results of which are contained in a most elaborate and exhaustive essay, read before the Medico-Chirurgical Society in December,

[1] For a translation from Dieffenbach's Operative Chirurgie containing his description of this operation, see the Dublin Journal of Medical Science for November, 1845.

[2] Extract from a paper on Staphyloraphy, by Professor Pancoast, in the American Journal of the Medical Sciences for July, 1843.

[3] For a description of this method of dividing the muscles of the velum, see Professor Sédillot's Traité de Médecine Opératoire, or Mr. Erichsen's Science and Art of Surgery.

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1844, and published in volume xxiii. of its Transactions. In this important paper, Mr. Fergusson has given an admirable account of the dissection of a specimen of cleft palate, which he was fortunate enough to procure from a dissecting-room subject, and adds a masterly analysis of the individual action of the various muscles of the palate in opposing the approximation of the edges of the fissure. He concludes by advocating the formal section of two of the four pairs of palatine muscles, viz., the levatores palati, and palato-pharyngei, as being the organs chiefly concerned in the separation of the flaps. The former of these muscles he divides with a slender curved knife, according to a plan original with himself, at a point somewhat higher than in my procedure with the scissors, and still further from the place of the lateral incisions of Dieffenbach. For the division of the palato-pharyngei muscles he snips the posterior pillars of the palate with strong curved scissors in precisely the same manner which I had already described, although it would appear from a slight typographical error in his quotation from my paper, that he did not fully comprehend this part of my description. At this date Mr. Fergusson had operated twice with success; in one of these cases, where the fissure extended a quarter of an inch between the palate bones, he had tried the plan of dissecting up the soft parts from the bones, but with only partial success, owing, perhaps, to the insufficient extent of his incisions. In 1846,[1] he had not yet succeeded in closing any fissures in the hard palate, although still disposed to give the operation further trials. At this date he had operated eight times for fissures of the soft palate, in six of which he was successful. In 1849[2] he had still had but little success in his operations upon the hard palate, but was able to report that of twenty-four cases of staphyloraphy, it had proved of advantage in twenty-one. The latest record which I have seen of Mr. Fergusson's experience is contained in one of a course of lectures delivered last year before the Royal College of Surgeons of London.[3] In this lecture he states that he has operated upon a hundred and thirty-four cases, with only five failures, which enumeration includes, however, "all kinds of cases, and refers chiefly to the cleft in the soft palate." He still prefers to divide the levatores palati muscles according to his original plan, although he

[1] See his System of Practical Surgery, 2d edition.

[2] See London Journal of Medicine for January and February, 1849.

[3] Lectures on the Progress of Anatomy and Surgery during the present Century. Reported in the Lancet and in the Medical Times and Gazette for 1864.

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admits the success which has been attained by other surgeons who have adopted the earlier device of deep lateral incisions through the velum. It would appear, however, from some of his published papers that he now makes the incisions above and behind the palate much more extensive than at first, and in that way may sometimes divide the greater part of the muscular layers of the velum, and so dispense with snipping across the posterior pillar.[1]

The subject of cleft palate has been still further illustrated by several British surgeons of distinction, among whom Messrs. Avery and Pollock, of London; Mr. Collis, of Dublin, and Mr. Field, of Brighton, are especially prominent. All these gentlemen have operated with the most perfect success upon fissures as well of the hard as of the soft palate, and they have all adopted my plan of separating the soft textures freely from the palatine arch.[2] Mr. Pollock, as has been already stated, divides the palate muscles by a partially submucous incision, at a point near the hamular processes, where the fibres begin to spread out into the velum.

Since the late important researches of M. Ollier, of Lyon, upon the agency of the periosteum in the regeneration of bone, the principles which he has made known have been applied to a very great variety of surgical operations. Following out these analogies, Professor Langenbeck, the accomplished teacher of clinical surgery in the University of Berlin, has proposed to apply the same principle to the operation for cleft palate.[3] Starting with the entirely erroneous assumption that previously to the year 1862, but a single trustworthy case had been reported of a completely successful operation for the closure of a congenital fissure of the hard palate—and that, the often quoted experiment by Krimer of the transplantation of inverted flaps of mucous membrane—he sought to explain the supposed want of success by the rather plausible theory that all previous operators had erred by dissecting up the mucous membrane only, and thus had formed flaps of such excessive tenuity as to preclude their proper nutrition. He, therefore, insists upon the

[1] Compare the description of this part of the operation as given in the paper in the London Journal of Medicine for 1849, and in the Lectures on the Progress of Anatomy and Surgery in 1864.

[2] Messrs. Pollock and Field have expressed themselves somewhat decidedly in favor of operating upon a part only of the fissure at a time, but Mr. Collis, who was at first of the same opinion, has lately given the preference to my original plan of completing the whole operation at a single sitting.

[3] Archiv für Klinische Chirurgie herausgegeben von Dr. B. Langenbeck, 2ter Band. Berlin, 1862.

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careful separation, from the bony vault, of the whole thickness of soft textures, taking especial pains to include the periosteum. The publication of these views, thus claimed as novel, immediately called forth statements from Messrs. Pollock and Field, and afterwards from Messrs. Fergusson and Collis, who all assure us that it was always their practice to dissect the membrane as cleanly as possible from the bone, as, indeed, must almost necessarily be the case, owing to the thinness of the layer, the intimate union of its different portions, and, more than all, the comparative looseness of its attachments to the bones.[1] Professor Langenbeck's method of separating the muco-periosteum from the bones scarcely differs from that employed by other operators, except that he uses blunt-edged, pointed instruments instead of knives; but he insists upon the necessity of making long lateral incisions through the coverings of the palate along the roots of the alveolar processes, and just in the course of the posterior palatine arteries, a proceeding which, as he informs us, is attended with pretty active bleeding. As a means of facilitating the separation of the membranes from the bones, in cases of extreme obliquity of the sides of the fissure, these lateral incisions may sometimes prove of great convenience, but I have seen very few cases in which they could have rendered any service in relaxing the flaps. In the course of an operation for the closure of an old syphilitic perforation of the hard palate I have known a most troublesome and persistent hemorrhage to occur from an incision in precisely the same situation as those recommended by Professor Langenbeck.

I propose now briefly to describe the different stages of the operation as I have lately performed it, comparing some of the methods which I employ, with those suggested by other surgeons.

1. *The Separation of the Palatine Membranes from the Bones.*—This procedure I have found necessary in fully nine-tenths of the cases upon which it has been my lot to operate. A large proportion of the fissures which at first sight seem confined to the soft palate, really extend a little way between the palatine bones; and even among those which apparently extend only to the margin of the bony vault, the top of the fissure is often of a rounded rather

[1] For references to thirteen published cases of successful operations for congenital fissure of both soft and hard palate, see the last pages of this paper. In all the thirteen cases there was perfect restoration of the velum with important diminution in the size of the fissure in the bones. In seven of the thirteen cases the complete closure of the cleft was effected.

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than an angular form, so as to render it difficult or impossible to bring the flaps together at this part without first loosening their attachments. By adopting this measure, however, the upper sutures are applied as easily as the lower ones, and the danger of partial failure at this particular part of the palate, formerly so common, is almost wholly obviated. In cases of more extensive fissure of the hard palate this separation is to be carried further, in some instances even to the alveolar processes. I have always completed the operation, as far as I have thought it proper to attempt it at all, at a single sitting, because in this way we are almost certain to obtain good union of the velum, and a partial closure, *par glissement*, of at least the posterior portion of the fissure in the bones. The closure of the anterior portion of extensive fissures of the hard palate is always a matter of considerable difficulty and uncertainty, and is, besides, of very little importance in comparison with the formation of a good septum between the mouth and nostrils behind. Whenever, by the re-establishment of the velum and of the posterior part of the palatine vault, we have succeeded in reducing the fissure to a simple foramen in the hard roof of the mouth, we have practically relieved the patient from his disgusting and distressing deformity, for he only needs a light metallic or vulcanite plate, such as is now worn by every one who has a set of false teeth, to enable him to articulate as well as if the aperture were closed by the natural bone and membranes. Led by these considerations, and by the desire to shorten as much as possible an operation which must almost necessarily be performed without the aid of anæsthesia, I have ceased, of late years, to operate for the closure of the anterior portion of the cleft in extreme cases, and this notwithstanding the fact that in my earlier years of practice I succeeded in completely closing a very large proportion of all the fissures upon which I operated, including some very extensive ones, and thus established the operation as a perfectly practicable one. In commencing this part of the operation, I have always used a knife substantially like that which I first employed, viz., a double-edged, spear-pointed knife, strongly curved on its flat side; which I have found to answer well for almost all fissures of moderate extent, although in some extreme cases, in which the bones have deviated widely from their normal curvature, very considerable difficulty has been experienced in making the first incisions at the edges of the fissure. In these cases there is often no proper roof to the mouth, owing to the extreme obliquity of

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the bones, which rise, as it were, almost vertically from the alveolar margins towards the nostrils. To facilitate these first incisions in such cases, it has been proposed by Dr. Smyly to commence the dissection with a slender knife, shaped somewhat like an ordinary gum lancet, and used through the nostril, where the edge of the fissure may be more readily reached than from the mouth. Sharply re-curved knives, worked from the mouth, have also been used for the same class of cases; and a particularly ingenious one has been invented by Mr. Pollock, in which a short chisel-shaped blade is attached to a metallic stem by means of a hinge, and is fitted with a screw movement by which it may be adjusted to any required angle. Both these contrivances have been tried and approved by Mr. Collis, and are doubtless of great utility in the cases for which they are designed. This commencement of the dissection at the edges of the fissure is by far the most difficult part of the operation, for it is at this part of the palate that the membranes are always found most firmly adherent to the bones. As we proceed, however, the separation becomes very much easier, and the membranes seem almost to peel off from the bones; I have therefore, at this point, generally abandoned the knife, and have continued the dissection, as far as I have thought necessary towards the alveolar processes, by means of curved scissors. In this way I have been sure of preserving the greatest possible thickness of tissues in the flaps without endangering their nutrition by the division of the palatine arteries. In most of the cases which I have seen there has been little or no deficiency of materials to fill the gap, but the fissure has been the result rather of the oblique direction of the ununited sides of the palatine vault. The operation consists, then, not so much in stretching the flaps tightly across the cleft, as in bringing them into a more nearly horizontal position. I have not, therefore, seen that much benefit is to be expected from lateral incisions through the palatine membranes, and have always abstained from making them, from the fear of causing needless and troublesome hemorrhage, and thus unnecessarily prolonging an already too tedious operation. At the posterior edges of the ossa palati the union between the soft parts and the bone is very intimate, owing to the insertion there of the tendinous fibres of the velum, and more particularly of the reflected tendons of the tensores palati muscles. For completing the separation at this point, I use a pair of probe-pointed scissors, which I have found to divide the firm tissues much more conveniently and expeditiously than any knife

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In all the operations which I have performed, I have met with but a single case of troublesome hemorrhage, notwithstanding the very free dissection of the coverings of the hard palate, a result which I am inclined to attribute to the peculiar manner in which the posterior palatine arteries are protected by the bony channels sunk for them at the sides of the hard palatine vault. At the moment of freeing the flaps from their attachments to the posterior margins of the palate bones, a few arterial twigs are generally divided, but I have always been able to control the bleeding by the use of iced water. In a single instance, however, in which the upper stitch was unusually tense, the bleeding continued after the adjustment of the sutures, but immediately ceased when the stitch was divided so as to allow the membrane to apply itself more closely to the bone.

2. *The Relaxation of the Two Halves of the Velum by the Division of Resisting Bands of Muscle and Mucous Membrane.*—This has been a most important feature in all my operations, and is still performed in the same manner as in my earliest cases. The instrument employed is a pair of large and strong French scissors, curved on the flat side. One of the halves of the split uvula is seized with appropriate forceps, and drawn across the fissure. This brings out in bold relief two strongly resisting bands, one below and one above the palate. The former, consisting of the posterior pillar of the palate, is then divided by a powerful stroke of the scissors, and the incision extended forwards and backwards, dividing as much of the mucous membrane as may be necessary to relieve all tension at this part. The other band, consisting chiefly, as Mr. Fergusson has shown, of the levator palati muscle, with its mucous coverings, is next divided in the same manner as the posterior pillar, including, as before, in the incisions, a greater or less extent of the adjacent mucous membrane, as may seem to be requisite to effect the perfect relaxation of the organ. The completion of this stage of the operation is shown by the striking change in the condition of the half of the velum, which, from a state of violent spasmodic contraction, burying itself, as it were, in the side of the throat, becomes perfectly flaccid and powerless. As soon as this result is attained, this part of the operation is to be considered as finished, whether the incisions have been more or less extensive; in some cases a comparatively slight snip of one or both muscular bands seems to suffice, while in others new resisting folds of mucous membrane come out, one after another, requiring successive division. By this method no part is divided until it has been first

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brought into a state of tension, and thus shown to require it, and there is no uncertain groping in the dark with knives applied to hidden muscles in a state of partial relaxation. For facility and certainty of execution, dividing no more and no less than is required, and for absolute freedom from danger, it seems to me that this method of relaxing the soft parts has never been surpassed. That other plans may be useful, I have no doubt; but whether they offer advantages equal to the present, can be settled only by a series of comparative trials in practice, such as have not yet been made.

3. *The Paring of the Edges of the Fissure.*—This is performed sometimes with scissors and sometimes with a slender, pointed knife, and I am not aware that there is any decided preference to be given to either method. The edge of the flap is made tense by drawing upon the uvula with a pair of strong but slender-toothed forceps, which I have devised for the purpose, and which are described in the *American Journal of the Medical Sciences* for January, 1853. These forceps, of which two pairs are required for the two sides, are made with a double curve, and are so contrived as to seize the extreme edge of the palate without encroaching more upon one surface than the other. The same forceps are employed also in the preceding stage of the operation to put the palate on the stretch, and, as a general rule, after once seizing the organ, I do not let it go again until I have pared its edge. I have not found it desirable to attempt to preserve the whole uvula, for it generally hangs so low in the throat as to cause irritation, and thus interfere with the success of the operation. In most cases, therefore, I remove the greater portion of the two halves of this appendage at the time of paring the edges of the palate.

4. *The Application and Adjustment of the Sutures.*—In the early days of staphyloraphy this was by far the most difficult and vexatious part of the operation, owing to the extreme irritability of the parts provoking violent muscular retraction whenever the flaps were pricked by the needle. After adopting the plan described for the relaxation of the organ, I observed that this stage of the operation was immensely facilitated, so that for a number of years I was in the habit of passing the sutures with a small curved needle held by forceps. Increased experience has, however, demonstrated the usefulness, in many cases, of the ingenious crochet-aiguille of Schwerdt, a sharply re-curved needle, mounted in a handle, and having an eye at its point which can be opened and

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closed by a slight pressure upon a spring. The instrument is threaded, and passed through the edge of one of the flaps from behind forwards, and one end of the thread drawn through by catching the loop with a tenaculum or hook. The needle, still threaded, is then withdrawn, and carried through the flap on the opposite side; the eye is then opened, and the thread wholly disengaged from it by drawing upon the loop. I have generally adjusted the middle suture first, by that means controlling the palate, and thus rendering the insertion of the others easier. The lower one is best inserted last. At the lower part of the palate, where the parts are very movable, I have found it difficult to fix them with this instrument, and therefore prefer to use a delicate curved needle held in a porte-aiguille. The chief objection to the needle of Schwerdt is the difficulty of keeping it sharp, owing to its being split at the point. Very broad sutures, made of a number of waxed threads arranged in the form of a flat band or tape, have been much employed in France, and Dieffenbach used to insist strongly upon the advantage of using wires of soft lead. I have always used a single thread of common, surgeon's silk, thoroughly waxed, and tied with the ordinary surgeon's knot. I have lately been in the habit of preparing the silk by soaking it a day or two beforehand in the compound tincture of benzoin, by which it acquires an adhesive property, and is less apt to slip when the knots are tied.[1] The sutures should not be drawn so tightly as to strangle the parts between them, or they will cause irritation and swelling. On the other hand, it is important to bring the opposite edges of the fissure into absolute contact with each other without much tension, or the stitches will as certainly cut their way out, and thus defeat the end for which they are employed. In an interesting case of operation for the closure of a very extensive fissure of the hard palate, performed by Mr. Collis, and reported in the *Dublin Quarterly Journal of Medical Science* for February, 1865, the flaps, although of ample breadth, tended obstinately to revert to their original position in contact with the bones, and thus caused injurious tension upon the stitches. This was overcome by the very happy and ingenious expedient of pushing the flaps, as it were, towards the median line, by means of wedges of sponge introduced between them and the bones; these were easily removed

[1] I owe this valuable suggestion to my friend and former pupil, Dr. Calvin G. Page, of this city.

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through the nostril after forty-eight hours, and the result was a nearly complete and most satisfactory union.

5. *The After-Treatment.*—This was formerly the severest and most vexatious part of the management of the case, owing to the supposed necessity of interdicting all use of the parts in swallowing for several days following the operation. Thus Roux enjoined complete abstinence from food and drink for five days, believing that the mere act of swallowing the saliva would disturb the ligatures and prevent union. In my first cases I also followed the same plan, nourishing the patients for several days solely by enemata. The obviously unfavorable effect of thus starving a person in full health, and accustomed to a generous diet, led Sir Philip Crampton, of Dublin, to try the experiment of allowing his patients an ample supply of soft food, such as boiled bread and milk, custard, soup, jelly, etc., during the whole period of the treatment. The publication, in January, 1843, of the two cases in which this plan had been successfully tried, was immediately followed by the abandonment of the old and most irksome restriction, and patients are now allowed as much liquid or semi-solid food as they desire. Much trouble is often experienced after the first three or four days from the secretion of tough adhesive mucus in and around the line of suture, which gives rise to an irritating cough of such severity as sometimes to threaten the destruction of the newly-formed adhesions. In this condition of the parts I have often seen much benefit from the use of warm or acid drinks, or from brushing the parts with a weak solution of nitrate of silver.

At first I was disposed to begin to remove the sutures at the earliest possible period, but latterly, from having once had all the adhesions give way during the act of withdrawing the threads, I have allowed them to remain a very long time. It is rather important that the mouth should not be too widely opened during the early stages of the adhesive process. Once, on the fifth or sixth day, I have known the entire wound to give way from the patient opening the mouth too widely for the purpose of inspection.

The number of cases of cleft palate upon which I have operated by these methods, is now between ninety and a hundred; of this number, in less than one-tenth was the fissure confined wholly to the soft parts, and in at least three quarters, the gap extended into or through the maxillary portion of the palatine vault. In not more than nine or ten cases, therefore, have I found it practicable to close the fissure without first dissecting up the membranes from

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the posterior part of the hard palate, and cutting through the tendinous attachments of the velum to the ossa palati. I have in no case been deterred from operating by the extent of the deformity, and in several cases, of most formidable aspect, I have succeeded in improving the voice, and facilitating deglutition, as completely as in even the simplest fissures of the velum. In one case of simple fissure of the soft palate, occurring some two years since, in a very young patient, I was tempted to operate without first dividing the muscles. The edges of the fissure came so easily together that any farther incisions seemed unnecessary; and for several days after the operation everything looked fair. On the whole, it was the easiest and most promising case I had had for several years. About the seventh day, however, the adhesions gave way, owing, as I believe, in part, at least, to the imperfect method adopted. As to the proper age at which to operate—in one case of a fissure which extended but little more than through the uvula, I operated on a child of between six and seven years; but generally it is necessary to wait until the patient is old enough fully to appreciate the importance of the operation, and to submit patiently to pain and inconvenience, for this is one of the very few operations in which the use of anæsthetics is inadmissible. Under very peculiar circumstances, I suppose, ether might be administered, but not without some risk to the patient, and much embarrassment to the surgeon, from the constant flow of blood down the throat.

The result of these operations may be stated briefly as follows With the exception of perhaps half a dozen cases, I have never failed to get more or less union of the soft palate. Sometimes one, or more rarely two, of the sutures have given way at the upper part where the tissues are put most fully on the stretch. If any of the stitches hold, however, and the smallest union takes place, it may be afterwards extended either by the renewal of the sutures, which is now a comparatively easy matter, or by the application, at considerable intervals, of the solid nitrate of silver to the angle of the remaining fissure. The great point is to establish the arch of the soft palate as completely as possible, and when this is once accomplished, any aperture which may remain in the hard palate can be effectually closed by simple mechanical means. In cases of extreme fissure extending through the alveolar arch, where a few artificial teeth are almost always required to fill the gap caused by the lost or distorted incisors, the plate upon which the new teeth are mounted serves also to close the remaining cleft in the

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roof of the mouth. In such cases, therefore, there is but little inducement for the surgeon to undertake, or for the patient to endure, a tedious dissection for the closure of an aperture in a part which must after all be covered by a plate. Of course, in all cases, the more completely the fissure can be closed by the operation, the better it is, but what I wish particularly to enforce, is the fact that even in the most extreme cases of very wide fissure in the bones, an operation can be performed which is as effectual in restoring the voice, and almost as easy of execution, as in cases of the simplest character, and confined to the velum or extreme back part of the palatine vault.

The question is often asked of the surgeon whether the voice will be immediately restored by the operation, and if not, in what time the full restoration may be expected. The answer must, of course, be very indefinite, for, in fact, the patient has now to learn, for the first time, the art of using the palate in articulation. Almost every patient, after the opening is entirely closed, experiences a sense of relief, which is owing both to the greater ease with which deglutition is performed, and also to the protection afforded by the new palate to the mucous membrane of the posterior fauces, which, before the operation, was dry and parched from the constant passage of the air over it. I have lately had occasion to see several patients two or three years after the operation. Two of them are teachers in public institutions, and the only defect to be perceived is a slight huskiness of the voice, which would hardly be noticed by any one ignorant of their former condition. I do not remember to have seen a case in which the patient was not materially benefited.

The following cases have been placed on record from time to time, not, however, from the wish to present full notes even of the more important among them, but rather to indicate the results of accumulating experience as influencing my estimate of the value of the operation, and my practice in the execution of its several details.

In my original paper, which was published in the *New England Quarterly Journal of Medicine and Surgery* for April, 1843, I gave the results of three cases only in detail, but stated that out of fourteen operations for fissure of both soft and hard palate, I had in all but one instance succeeded in effecting the union of the fissured velum, and had, besides, either entirely closed the cleft in the bones, or had so far diminished its size as to admit of its easy

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and perfect closure by a plate fitted to the adjoining teeth. The following is a concise summary of the three cases then reported, for the original account of which I refer to the paper just cited:—

CASE I.—This is the first case upon which I operated, and the operation and its results have already been given at length at the beginning of this paper. The patient was a young man, 25 years of age, with congenital fissure of the velum and left side of the hard palate, extending as far forward as the anterior palatine foramen. The immediate result of the operation was the re-establishment of the arch of the soft palate, together with the closure of the posterior half of the fissure in the bones. A second operation, several months after the first, effected the closure of half of the remaining fissure, leaving an aperture through the roof of the mouth of only one-quarter the size of the original cleft in the bones. The hole was covered by a gold plate. There was great improvement of the voice.

CASE II.—A woman, 35 years old. Fissure of velum, and extremely wide cleft in left side of hard palate and alveolar arch, with harelip. Teeth separated nearly an inch in front. Operation, June 23, 1841, on hard and soft palate and harelip, all at one sitting. *Result:* Perfect union throughout in seven days, with immediate and very great improvement in the voice.

CASE III.—Congenital fissure of soft and hard palate, with cleft in the bone three-quarters of an inch in width. Operation in December, 1842. *Result:* Perfect adhesion and removal of sutures in forty-eight hours. A small aperture at the upper angle was obliterated in a fortnight by the use of caustic.

In the fourteen cases upon which I had operated at the date of this paper, I had followed the practice laid down by Roux, of confining the patients to bed, and enjoining entire abstinence from food and drink during four or five days following the operation.

During the three years next succeeding this publication, I continued to operate upon the same class of cases in the same manner and with the same success as before. I had, however, been led by the researches of Mr. Fergusson to reflect more particularly than before upon the effect of my incisions in the sides of the throat in dividing the fibres of certain of the palatine muscles, and had repeated, with marked success, Sir Philip Crampton's experiment of feeding the patient during the whole course of the after-treatment. In April, 1846, I commenced to record a second series of cases, which, to the number of ten, were published in the *American*

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Journal of the Medical Sciences for April, 1848. The following is a short *résumé* of them:—

CASE I.—Congenital fissure of soft and hard palate, with harelip. The lip had been operated on in infancy, with the usual effect of narrowing the cleft in the alveolar arch. Speech scarcely intelligible. Operation April 4, 1846; six sutures were used. *Result:* Good union of velum, but failure in the hard palate, owing to the occurrence of hemorrhage and the consequent formation of coagula forcing the flaps apart. (This is the only case in which I have had trouble from this cause.)

CASE II.—Congenital fissure of hard and soft palate, with an excessively wide gap in the bones. A most unpromising case. Operation in April, 1846; five sutures. *Result:* Perfect union of velum, with obliteration of about two-thirds of the whole fissure. Obturator fitted. Speech very much improved.

CASE III.—Congenital fissure of soft and hard palate, the latter half an inch in width. Operation Sept. 26, 1846; four sutures. *Result:* A very small aperture remained at the upper angle of the fissure, which healed in a little more than a month, after being touched a few times with nitrate of silver. Voice greatly improved.

CASE IV.—Congenital fissure of velum and of hard palate through the ossa palati. Operation Oct. 8, 1846. After three days the wound seemed about to suppurate, and the sutures threatened to give way. An additional suture was applied at the lower part of the fissure. *Result:* Partial union, which was afterwards completed by the occasional use of caustic and scarifications. New velum quite flexible, and speech much improved. (The trouble in this case was afterwards traced to the accidental use of a new sponge containing sand.)

CASE V.—Congenital fissure of soft and hard palate, extending two-thirds of an inch into bones, and of about the same breadth. Operation Oct. 13, 1846; five sutures. *Result:* Velum well united. A small opening remained at upper angle of fissure, which was closed after a few months by the use of caustics.

CASE VI.—Congenital fissure of the palate, with division of the bones. Operation Dec. 16, 1846; six sutures. Severe vomiting occurred on the second day, but without material damage to the new adhesions. *Result:* Complete union, except a minute hole at apex of fissure, which closed of itself in less than two months.

CASE VII.—Congenital fissure of palate, extending an inch into the bones; this portion of fissure of unusual width. Operation

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March 31, 1847; five sutures. Two stitches removed on the third day, the rest on the fourth; fissure seemed closed in whole extent. On the fifth day he very heedlessly ate hard biscuit and cake, by which he burst open the upper part of the fissure; the velum remained united. The remaining opening in the hard palate was closed in about half its extent by a second operation in the June following. *Result:* A small opening remained through the hard palate at the apex of the original fissure.

Case VIII. was similar to the last; bones widely separated. Operation May 31, 1847; four sutures. *Result:* Soft palate united; small fissure remaining in bones.

Case IX.—Congenital fissure of soft and hard palate, extending through nearly one-half of the bony vault. The fissure in the hard palate was very narrow, and with remarkably shelving sides, so as to render it extremely difficult to separate the membranes at the edges of the cleft; with patience, however, this was finally accomplished. Operation July 13, 1847. Three days afterwards the stitches were removed, and the whole extent of the fissure seemed to be closed. *Result:* Perfect union, except a small aperture at the upper angle, which was, however, obliterated by the use, first of lunar caustic, and afterwards of strong tincture of cantharides.

Case X.—Congenital fissure of the soft and hard palate, with double harelip. Patient twenty years of age. By an operation performed on the lip six years before, the intermaxillary bone had been almost wholly removed; as is usual after this operation, the maxillary bones had been dragged into contact with each other in front. The palatine processes of the maxillary and palatine bones seemed almost wanting, and the whole arch was very narrow. Operation. From the extreme deficiency in the bony vault, the membranes could not be made to come together across the gap. The velum, however, united. After a fortnight, finding that the coverings of the hard palate had become very much thickened, I again dissected them up, and this time was able to unite the flaps by suture. *Result:* Partial closure of the gap left after the first operation, with a thickened, fleshy state of its edges, which seemed to promise a still further diminution in its size, or possibly even its entire obliteration. This remaining hole, which was quite small, was closed by two bits of elastic vulcanized India rubber stitched together in the form of a shirt-stud. A plastic operation was after-

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wards performed upon the lip and nose, with the effect of very greatly improving the appearance of the patient.

In all the ten cases of this series the patients were allowed to take liquid nourishment freely, and, for the most part, to sit up and go about the house. In none of them was there any constitutional disturbance or any severe inflammatory action.

On the 13th of September, 1852, and again July 11th, 1853, I made a few verbal statements upon cleft palate to the Boston Society for Medical Improvement, which were afterwards printed in the Secretary's report in the *American Journal of the Medical Sciences* for January and October, 1853. On these two occasions I alluded to nine operations which I had performed within a short time, but which I did not report in full. The object of these few remarks was—1st, to show the instruments which I then employed, including the forceps described in an earlier part of this paper; and 2dly, to show that in cases of extreme fissure, extending far into or through the bones, it is generally sufficient to operate for the restoration of the soft palate and the back part only of the hard palate, leaving the anterior extremity of the fissure to be covered by a palatine plate, such as is ordinarily used in mounting artificial teeth.

In October, 1863, I published in the *American Journal of the Medical Sciences* a short *résumé* of my recent views and practice in cases of cleft palate, in which I alluded to four cases which I had chanced to see within a day or two of each other and of the date of writing. In that article I attempted mainly to show the importance of restoring the velum and posterior portion of the hard palate as nearly as possible to the normal condition of the parts, leaving it, in extreme cases, to the judgment of the surgeon and the feelings of the patient to determine whether to attempt to close the whole fissure in the bones by an operation, or to employ mechanical means to cover the front part of it. That the former course is perfectly practicable, even in very bad fissures, my earlier published cases abundantly prove, although of late years my judgment has become more and more decided against its necessity in the majority of cases which apply to the surgeon for relief.

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APPENDIX.

CASE OF FISSURE OF THE HARD AND SOFT PALATE, WITH MEDIAN FISSURE OF THE ALVEOLAR ARCH, AND DOUBLE HARELIP.

I take this opportunity to put on record a very remarkable, and, as I believe, hitherto undescribed malformation, viz., a double harelip complicated with *median fissure of the alveolar arch* and of the hard and soft palate. The patient was a young man, seventeen years of age, upon whom a very dextrous and perfect operation for double harelip had been performed in infancy by my friend Professor Willard Parker, of New York. At this time, as Professor Parker has kindly informed me, he removed from the extremity of the vomer a small osseous tubercle which formed a projection similar to that often caused by the intermaxillary bones in cases of double harelip complicated with double fissure of the alveolar arch. I had been consulted from time to time on account of the cleft in the palate, but it was not until he had attained the age of seventeen years that he finally came to me for an operation. This was performed in the manner already described at length in this paper, with the result of perfectly re-establishing the velum and covering the posterior portion of the cleft in the bones. The operation was more difficult than usual, owing to the small size of the mouth, resulting from the previous operation on the lip and the unusual obliquity of the two ununited halves of the palatine vault, yet the improvement in articulation was more speedy and more decided than I remember ever to have observed in any other case. A very few weeks after the operation he was able to wear a gold plate which was made for him by Dr. Rufus E. Dixon, of this city, and it was at this time that my attention was particularly attracted to the alveolar arch and the anterior portion of the fissure. The upper lip was so closely applied to the teeth in front as wholly to conceal them, except when lifted with the fingers. A glance at this part of the mouth revealed a remarkable deviation from the ordinary condition of the jaw in this deformity, inasmuch as it showed the existence of a perfectly symmetrical median fissure extending completely through the alveolar arch, between the central incisor teeth. Upon the right side of the cleft were seen the first and second permanent incisors; then the canine tooth, out of line, and placed rather above and in front of its normal position;

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then the two bicuspids; and lastly the two molars. In front of and above the right lateral incisor was the corresponding milk-tooth, hanging quite loose in the gum. Precisely the same number of teeth existed on the left side of the cleft, even to the presence of the lateral incisor of the temporary set. The central milk incisors had also formerly existed, one upon each side of the fissure, but had been removed a few years before, on account of a tendency to cross each other and press against the lip. At my request, Dr. Dixon removed the two remaining milk-teeth, and also the right central incisor of the permanent set, which seemed disposed to take an awkward position as regarded both the lip and the jaw. A cast of the mouth has been preserved and figured, showing the position of the fissure and the arrangement of the teeth.

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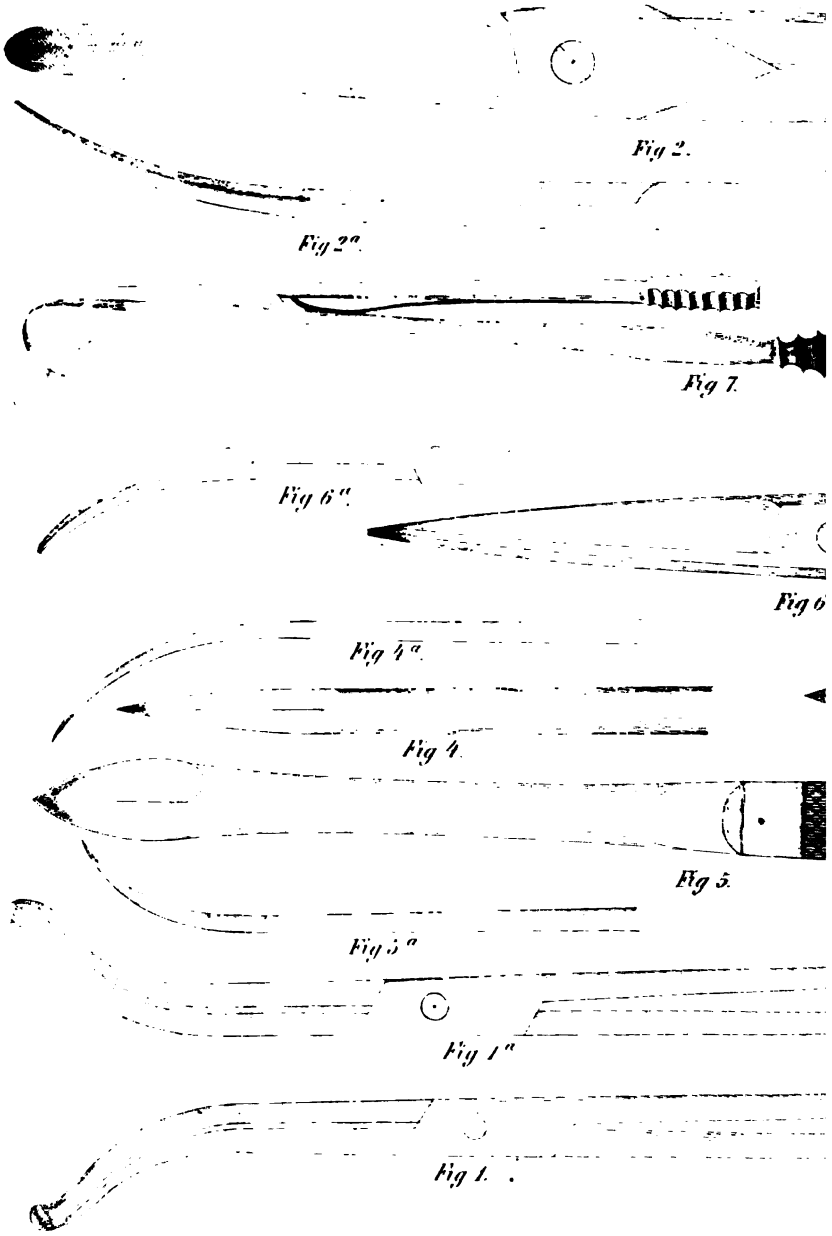

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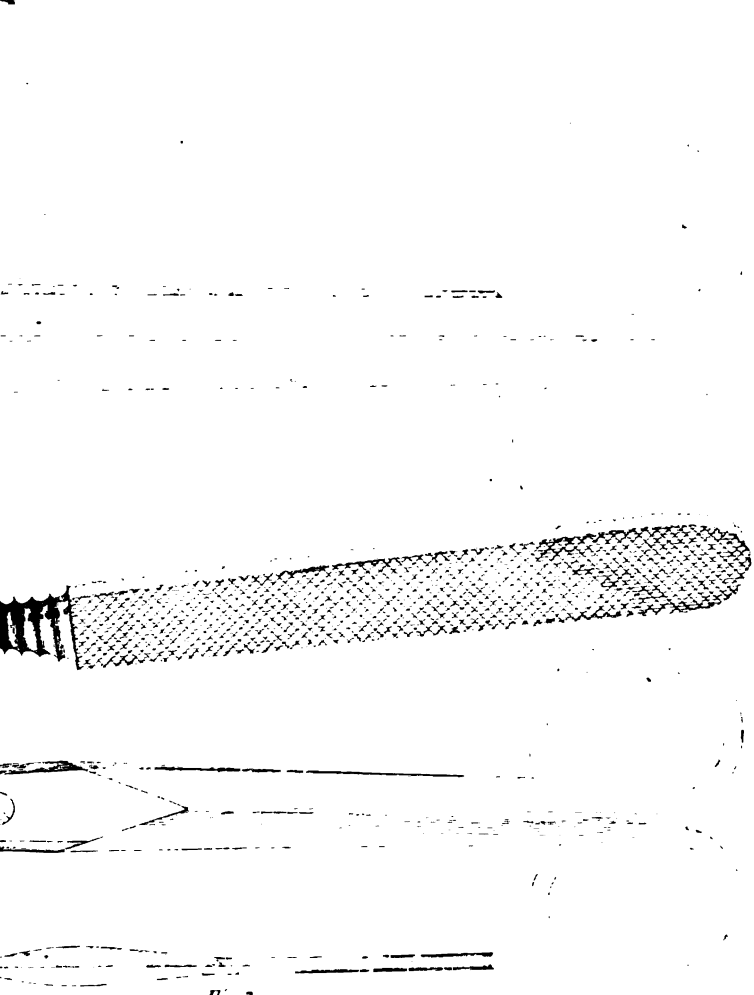
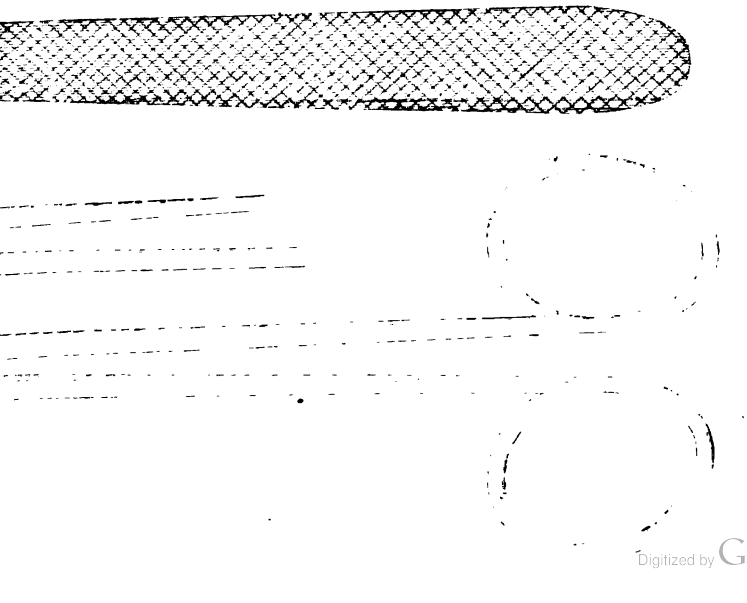


Fig 3.



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DESCRIPTION OF PLATE I.

INSTRUMENTS EMPLOYED IN OPERATIONS FOR CLEFT PALATE.

Figs. 1 and 1*a*. Forceps for seizing and holding the edge of the fissured velum. They are in pairs, one for each side of the fissure. Fig. 1 being for the left side, and Fig. 1*a* for the right.

Fig. 2. Strong French scissors curved on the flat side, shown in profile in Fig. 2*a*; used for dividing the posterior pillar and other resisting bands, and for paring the edges of the fissure.

Fig. 3. Slender spear-pointed knife which I have sometimes used to pare the edges of the fissure.

Fig. 4. Curved spear-pointed knife, shown in profile in Fig. 4*a*, which I originally employed in separating the membranes from the palatine vault.

Fig. 5. A knife similar to the former, represented also in profile in Fig. 5*a*, but broader and shorter in its curve. This is the knife which I have used, for the last ten or fifteen years, in commencing the dissection of the covering of the hard palate.

Fig. 6. Curved scissors, smaller than those shown in Fig. 1, and with points nearly sharp; used in completing the dissection of the membranes from the bony palatine vault. Shown in profile in Fig. 6*a*.

Fig. 7. Crochet-aiguille of Schwerdt, represented as closed and with a thread in its eye. By pressing upon the lever the eye is opened and the thread disengaged.

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DESCRIPTION OF PLATE II.

Plate II. shows the state of the parts in the case of median fissure reported in the Appendix. Being taken from a cast made after the operation, it shows the restoration of the posterior part of the hard palate, together with the velum; it serves also to give a general idea of the extent to which I now aim to close extensive fissures in the bony arch.

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Dr. J. Mason Warren's case of median fissure of the palate and alveolar arch. (Drawn from a cast of the mouth taken after the restoration of the velum and posterior part of the hard palate by an operation.)

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ON THE

MECHANICAL TREATMENT

OF

CHRONIC INFLAMMATION

OF THE

JOINTS OF THE LOWER EXTREMITIES,

WITH A

DESCRIPTION OF SOME NEW APPARATUS

FOR PRODUCING

EXTENSION AT THE KNEE AND ANKLE-JOINTS.

BY

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VOL. XVI.—25

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ON THE MECHANICAL TREATMENT OF CHRONIC INFLAMMATION OF THE JOINTS OF THE LOWER EXTREMITY, WITH A DESCRIPTION OF SOME NEW APPARATUS FOR PRODUCING EXTENSION AT THE KNEE AND ANKLE-JOINTS.

THE causes, pathology, and symptoms of the various diseases of the joints have been so accurately described by Brodie, Barwell, Guerin, Bouvier, and others, as well as in the numerous monographs upon the subject, that it would be superfluous to repeat their description. The fact, also, that chronic inflammation of any joint produces reflex contractions, causing deformity and severer pain, by increasing pressure on the diseased surfaces, thus making extension and counter-extension a necessary part of the treatment, has been so fully proved by myself and others who have written on this topic, and is now so generally admitted, that no further comments are necessary.

It is, in addition, acknowledged that the confinement, formerly necessary to produce the requisite extension and counter-extension, was so injurious to the general health of the patient, that the advantages were sometimes overbalanced, and exercise in the open air became a necessity in order to save life, even at the expense of a deformed limb. Moreover, the immense advantage given to patients with disease of the hip-joint, since the introduction of mechanical appliances, which allow exercise without discontinuing the extension, is so evident, that no one at all conversant with the disease and its proper treatment, will attempt to deny it.

The object of the present paper is, therefore, to show the practical utility of this very principle of treatment to the diseases of the knee and ankle-joints, even when they have extended to suppuration and caries; and to illustrate it by the narration of some cases which have come under my personal observation.

Before proceeding, however, with a description of the apparatuses

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for the knee- and ankle-joints, it may not be inappropriate briefly to refer to the improvements made in the apparatus for the treatment of hip-disease, since the publication of my report to the American Medical Association, in 1860.

In the first and second stages of the disease—when the limb is apparently longer, and the knee and thigh both flexed—extension is kept up at night by a weight and pulley fixed to the foot of the bed, which is elevated some inches, in order to make the body a counter-extending force, and thus avoid the necessity of a perineal band. The weight is fastened to the foot either by a buckskin boot, laced snugly around the ankle, or by strips of adhesive plaster placed on either side of the leg, carefully secured by a well-adjusted roller, with pieces of webbing sewed to their lower ends, which can be folded under the stocking during the day. If the thigh is very much flexed, another pulley is placed over the first, at such a height as to allow the force to be applied from above the knee, nearly on a line with the distorted thigh: this pulley is lowered by degrees as the patient can bear it, until the limb is brought to a straight line with the body, or as nearly so as may be, when the new force can be dispensed with, and the weight applied to the foot alone. In the daytime, or while the patient exercises, the extension is continued in this stage of the disease by means of an extension splint applied to the thigh only, and which allows free motion at the knee-joint.

The instrument consists of a flange of very firm sheet-iron, three or four inches long, and one or two inches wide (according to the size of the patient), slightly curved, and which, when cushioned, fits directly under the crest of the ilium. At each extremity is a buckle to secure the perineal band, made in the centre, of buckskin stuffed with hair, and with ends of elastic webbing to attach to the buckles. On the outer side of the flange is a ball and socket or universal joint, to receive the head of the splint, which runs down the thigh to within three or four inches of the extremity of the femur, and is capable of being made longer or shorter by a cog-wheel worked with a key. Near its lower extremity is attached a branch, which, curving over the thigh, extends as far down as the main splint, and both terminate in broad ends with a roller over which the webbing attached to the adhesive plaster plays, and is secured to the splint by means of buckles near each lower extremity. (Fig. 1.)

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To apply the splint, very strong adhesive plaster is required, or else two or three thicknesses of the ordinary plaster, cut in a fan

Fig. 1.

Sayre's splint for extension in morbus coxarius in the first and second stages.

shape (Fig. 2), and long enough to reach, on the inner side of the thigh, from the perineum to within three or four inches of the con-

Fig. 2.

dyle of the femur, and on the outer, from the trochanter major, to a point directly opposite the end of the inner plaster. These plasters are secured by a well-adjusted roller, and after pressing them well with the warm hand, to obtain a firm adhesion, the instrument is laid over the thigh, and the webbing, which is attached to the plaster, firmly fastened over the rollers to the buckles on the lower extremities of the instrument;—the perineal band is then buckled on, and the instrument is extended, with the key, to just such degree as is required to make the patient comfortable, and then locked by the slide.

This instrument should be worn as a guard for some months

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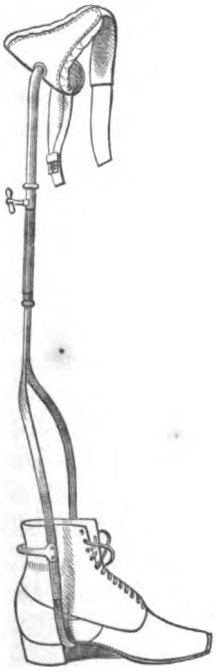
after the patient is entirely well, as I have seen many cases return from very slight causes, after being perfectly well for a long time. In order to prevent the limb from swelling below the bandage, it is necessary to support the circulation either by an elastic stocking, or by a roller and a knee cap.

These instruments are made with great perfection by Messrs. Otto & Reynders, Tieman, or Wade & Ford, of this city.

In the third stage of the disease, when the limb has become shorter and the patient can, therefore, walk with the stiffened knee without difficulty—which cannot be done in the first and second stages, without a very awkward circumduction—the same principle can be much better applied by using the instrument first described by Dr. Andrews, of Chicago. It consists of a crutch in the perineum, with a wide flange curving around the gluteo-femoral fold, a ball and socket on its under surface opposite the tuberosity of the ischium, a rod running from it, to the heel, capable of being elongated at pleasure, and terminating at its lower extremity in two branches—the lower extremities of which are rounded or knobbed, to fit into iron cups or sockets which are well secured into the heel of a nicely-fitting laced boot; a thick buckskin tongue lies over the instep, before it is laced, for protection when the extension is applied. The boot being neatly laced without wrinkles, the forked prongs are inserted behind the heel into the sockets, and the crutch then slipped into the perineum. The instrument can then be extended by the cog-wheel and key, until the patient can bear pressure without pain. Its great advantage is, that force can be applied without girdling the limb with a roller, as must be done when adhesive plaster is used, which is a very great desideratum.

Fig. 3.



I have used this instrument in many cases where the limb was shorter than the other, with very great advantage, and can therefore recommend it highly. Those I have used were made by Messrs. Otto & Reynders, 58 Chatham Street, after the annexed pattern, which, I presume, is so much like Dr.

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Andrews' splint, that I think he is entitled to the credit of making the suggestion. (See Fig. 3.)

Of course, the mere application of mechanical force to overcome one of the effects of disease, viz., muscular contraction, is not intended to supplant or prevent the adoption of the well-established principles of treatment, but merely as auxiliary thereto; but as the object of this paper is simply to explain the construction and application of mechanical force, it is not deemed necessary to enter further into the general principles of treatment, and we shall, therefore, proceed to the narration of some few cases where this principle has been applied satisfactorily to diseases of the knee- and ankle-joints.

REPORT OF SOME CASES OF CHRONIC DISEASE OF THE KNEE AND ANKLE-JOINTS, AND THEIR TREATMENT BY MECHANICAL APPLIANCES.

CASE I. *Thomas B. Clark, Fourth Street. Strumous synovitis of knee-joint; suppuration; luxation; anchylosis; operation; recovery.*

This patient had scarlatina when two years old, following which he had inflammation of the left knee-joint of the strumous variety, commonly called white swelling. After about eighteen months, contraction of the muscles took place to such a degree as to cause subluxation of the tibia backwards into the posterior inter-condyloid notch. Eight or nine fistulous openings around the outer part of the knee led to carious bone and into the joint. Drs. R. K. Hoffman and R. S. Kissam had examined him, and pronounced amputation the only means of cure.

I was called to see him in the spring of 1853, in consultation with Dr. Batchelder, who advised compression by means of sponge, and gradual extension: this was faithfully persisted in for some months, but with no appreciable improvement in the position of the limb. The sinuses on the outer side of the knee were then laid freely open —connecting with the joint—giving exit to a large amount of pus, and some carious bone which seemed to come from the *external* condyle of the femur and the patella only. The joint was freely injected with warm water, and the wound kept open by tents of oakum saturated with Peruvian balsam. Small pieces of bone continued to exfoliate for some months, when the wounds gradually cicatrized, and the parts became perfectly healthy; but with no improvement in the position of the limb. All the constitutional symptoms improved from the time the joint was freely opened; his appetite increased, and his sleep was tranquil without narcotics.

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In January, 1854, as his general health had become restored, I decided to attempt to improve the deformity by tenotomy of the hamstring muscles and *brisement forcé* of the knee-joint. Dr. Louis Bauer, of Brooklyn, saw him with me, and rendered me most valuable assistance in the performance of the operation. The boy was perfectly anæsthetized with chloroform, the tendons divided subcutaneously, the wounds carefully closed with adhesive plaster and a roller, and then the knee-joint forcibly broken—by flexion and extension, and internal rotation—until the limb was brought parallel with the other, and almost perfectly straight. A tight roller was applied from the toes up to near the knee; a large sponge placed in the popliteal space, and strips of adhesive plaster were applied over the sponge, and drawn *tightly* around the joint from the bandage below the knee, to some six inches above it. The roller was then continued over the plaster, snugly applied to the whole thigh. A piece of sponge about two inches in length, and about the size of the fore finger, having been placed over the track of the femoral artery—as is my usual custom in this operation—the roller was carefully applied to cause partial occlusion of the calibre of the artery, and thus diminish the supply of blood to the joint, without being so tight as to induce its complete strangulation. Two pieces of firm sole-leather, cut to fit the foot and limb in its entire length, having been softened by soaking them a few minutes in cold water, were applied on either side of the foot and limb, and secured by a bandage. Great care was taken to model the leather, to all the inequalities of the part, while it was still soft and pliable, and the limb was forcibly held in its improved position until the leather became dry and hardened, when it retained it as perfectly as any plaster mould could do.[1]

I wish to call especial attention to the principle involved in the dressing in this case, as I think it of cardinal importance, having witnessed its practical benefit in many serious operations. I mean the pressure on the main trunk of an artery leading to any part in danger of inflammation, in such manner as to diminish the supply of blood, to prevent inflammation by partial starvation. Great caution is, of course, necessary not to produce gangrene; but a

[1] Subsequent experience has taught me that it is better to close the wounds and retain the limb at perfect rest in its abnormal position until the external wounds have healed (which will generally be done in five or six days), before proceeding to break up the bony adhesions.

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little practice, and close observation, will soon give the necessary tact of knowing how to *use* pressure, without *abusing* it.

In this case of young Clark, although the operation was very severe, and the force required to break up the adhesions very great, and continued for some time with rather rough manipulation in order to get the limb in good position, yet it was not followed by any constitutional excitement or irritative fever.

The boy took an anodyne the first night only, and from that time had no pain or trouble whatever. The limb was kept immovable in the leather splint, and was not disturbed in any manner for thirteen days. At the expiration of that time it was dressed and found perfectly satisfactory, the wounds all healed, with no inflammation about the joint. Our object being to obtain anchylosis, the limb was again re-dressed, but without the sponge over the femoral artery. At the end of two weeks, on again examining it, it looked so favorably that I determined to produce a movable joint, instead of anchylosis. Passive motion was tried, with great care at first, but afterwards continued with much more freedom, and finally resulted in a very useful joint, having about two-thirds the motion of a natural one.

The patella is very small—not more than one-third the size of the opposite one, the external condyle of the femur is very much reduced, there is paralysis of the peroneal muscles, from slough of the peroneal nerve, the foot is smaller, and the leg one inch shorter than the other. Yet, with a high heel, an elastic spring on the outside of the shoe, and an India rubber substitute for the peroneal muscles—running from the top of the fibula to the ankle, where it terminates in a cat-gut cord, which plays around a pulley, and is inserted at the outer margin of the sole of the boot near the toe—the boy walks, dances, runs, and skates with his playmates without crutch or cane.

CASE II. *Chronic synovitis of knee-joint, with angular contraction and probable ulceration of cartilages; tenotomy; extension by splint; recovery.*

Ann H——, Jersey City, aged 14; father healthy, but mother died of phthisis; fell, when nine years of age, on the side-walk, striking her right knee on the curb-stone, producing a severe inflammation of the knee-joint, which confined her to her bed for some weeks. Leeches, cups, poultices, and the usual antiphlogistic

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treatment was adopted for some time, and finally resulted in a favorable recovery. For nearly a year she considered herself well, although she always had more or less pain in the knee-joint, after any very severe exercise; but it was not thought of sufficient importance to call for professional advice, as it generally subsided by a few days' rest, although her father had applied a blister to it occasionally. When about twelve years of age she again sprained the joint, by slipping on an orange-peel, which produced the most intense pain, immediately after the accident, and which continued until the time I saw her, two years after. She had been cupped and leeched repeatedly; blisters and issues had been applied for some months, but all without any benefit, until the agony became so intense and the general health so much prostrated, that the disease was decided to be incurable, amputation advised, and I was sent for to perform it. Dr. Wm. K. Cleveland went with me to assist in the operation. We found the girl sitting on a chair, with her knee flexed at an acute angle, the foot resting on a stool a little lower than the chair on which she sat, her body strongly bent forward, and both hands firmly clasped around the limb just below the knee, to prevent, as far as possible, any movement at the joint; at the same time she appeared to push, with considerable force, and stated that that was the only way in which she could get any ease. Her father stated that she had sat in that position most of the time—day and night—for the past three months; she would not let go her leg even to feed herself, and they had therefore to feed her. Whenever her position was changed, either to be put in bed or to attend to the necessary calls of nature, it produced the most intense paroxysm of pain, which frequently lasted some hours, and could not be relieved by any anodyne, although she took morphine in very large doses, constantly. Her knee was very much enlarged, almost transparently white, the irregular contours quite defaced by the general rounding out of all the parts. The leg below the knee, and the thigh above, were very much smaller than the opposite one. Her pulse was 160; her face very pale and emaciated, and her countenance bore the most marked expression of intense suffering that I have ever witnessed. It was impossible to walk about the room, or in any way jar the floor, without causing her to scream in agony.

When Dr. Cleveland took hold of her foot, to move her in position for the operation, she seized him by the arm with her teeth, and held on with the grip of a tigress, until I grasped her limb above

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and below the knee, and by firm extension and counter-extension, to separate the bones from each other, gave her such relief that she let go her hold upon his arm. So long as I continued the extension she seemed comparatively quiet, and said it gave her great relief; but the instant that I relaxed at all she screamed in agony. This fact decided me not to amputate, until she had had the benefit of extension fairly tried. It was impossible to do this efficiently without first dividing the hamstring muscles, as the leg had been so long contracted. I therefore held the limb still while Dr. Cleveland put her under the full influence of chloroform, when I divided the outer and inner hamstring tendons subcutaneously, covering the wounds immediately with adhesive plaster and a roller. By a very slight force the limb was brought immediately almost straight. A long strip of adhesive plaster, about four inches in width, was secured to both sides of the leg by a roller, for the purpose of making extension; and in the loop below the foot a board was placed, wide enough to remove pressure from either malleolus. To this board a cord was attached, and run through a hole made in the foot-board and over a pulley, and to its other extremity I attached a smoothing-iron weighing about five pounds. Two bricks were placed under each post at the foot of the bed, to raise it higher than the other end, so that the body, constantly gliding in the opposite direction, would make a proper counter-extending force, without the necessity of a perineal band. This was all accomplished before she had come from under the effects of the chloroform; and when she recovered her senses, she said she felt perfectly easy. As she had already taken a large dose of morphine just before we arrived, nothing more was given her; but instructions left to administer to her twenty drops of Magendie's solution in the night if necessary.

She passed a more comfortable night than she had done for months, and from that time took no opiate nor other anodyne. Her appetite improved, and her bowels became regular, without the use of any cathartic medicine. Iron and quinine were the only remedies given, together with the most nutritious food that she could digest. A large coarse sponge, placed around the entire knee-joint, and secured by a very firmly applied roller, was thoroughly wet in cold water, and constantly kept so, by frequent irrigations day and night. The extension of the joint by the weight and pulley, and the compression by the wet sponge were continued about two months, after which I made extension by means of an apparatus I have been using for some years, and which allows

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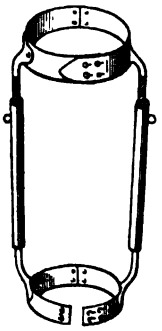
the patient to exercise in the open air at the same time that the extension is continued, which is so important in the treatment of all chronic inflammations of the joints. Although I have used this apparatus in many cases with most marked benefit, both in private practice and in Bellevue Hospital, for nearly seven years, yet I have never published or described it, except to the different classes of students in attendance at the Hospital. But having tested it thoroughly, I can commend it with confidence, in all cases where extension of the knee is required, and exercise at the same time necessary.

The apparatus is constructed in the following manner: Two bands or collars of firm sheet-iron, about an inch wide, embrace the limb—the one above the ankle the other at the upper third of the thigh—by means of a hinge on one side, and a lock on the other like a dog-collar, and connected, on either side, by a firmly-riveted steel rod, in the centre of which works a male and female screw, which can be retained at any given point by a small thumb-screw working in its side and fastening to the worm or thread of the larger screw. (See Fig. 4.[1])

Fig. 4.



Dr. Sayre's apparatus for extension at knee-joint.

To apply this instrument, adhesive plaster is required, spread on strong cloth and cut in strips one inch wide, and long enough to reach from just below the knee to near the ankle, and also from the knee for several inches above the joint, upon the thigh, as seen in Fig. 5.

These plasters are secured to within an inch of their extremities by a snugly-adjusted roller, as seen in Fig. 6. The instrument is then placed on the limb, the collars fastened sufficiently tight to be comfortable, and the loose ends of the adhesive plaster turned over them and secured by a roller. The connecting rods are extended by means of the screw, the articulating surfaces of the tibia and femur separated from each other, and the limb brought nearly straight, as in Figs. 7 and 8, until pressure can be made on the

[1] Since writing this paper I have made an improvement in this instrument by dividing the rings into two halves, which *slide* together in place of being hinged. The plaster has a strong loop of webbing sewed on each strip, and the separated ends of the rings can be passed through these loops before being locked, which is more neat than the former plan, and more easily readjusted.

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foot without pain. A roller is applied over the foot and leg up to the instrument, to prevent œdema. A large coarse sponge is placed in the popliteal space, and other pieces of sponge completely surround the knee-joint; these are secured by a tight roller, and then

Fig. 5.

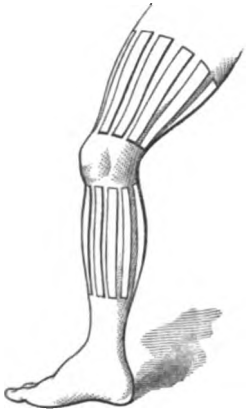


Fig. 6.

Fig. 7.

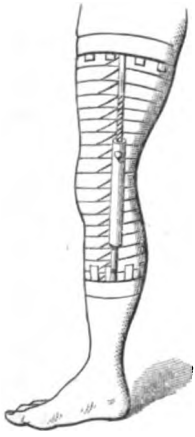
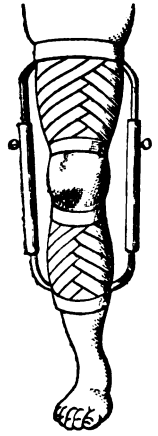


Fig. 8.



saturated with cold water. The cold water not only reduces the inflammation of the joint, but, by increasing the pressure of the sponge, promotes the absorption of the deposits that generally occur around and in a joint in this condition of chronic inflammation.

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The instrument was applied in the case of Ann H——, in the manner described, and when the extension was exerted, she could bear almost her entire weight upon the limb; but when the screws were shortened so as to remove the extension, the slightest pressure upon the foot gave her the most intense agony. With the instrument properly adjusted, she could exercise in open air upon her crutches,[1] with the greatest freedom, and in perfect comfort. From this time her general health began to improve rapidly. After the first application she came to my office from Jersey City, a distance of several miles, every few weeks to have it readjusted, and each time showed evidences of most marked improvement. It was almost a year before she could bear much pressure without pain, when the extension was removed; but as this pain subsided, I became more free in my use of passive motion, and in about twenty months from the time of the operation, I had the satisfaction of seeing her walk without pain, and with tolerable motion of the joint. It is now nearly five years since this case was under treatment, during which time she has enjoyed uninterrupted good health, and at the present time the motions of her knee-joint are so perfect that no one but a critical observer would suspect that there had been any disease there.

CASE III. *Suppuration and caries of both ankle-joints from injury; double talipes-equinus; operation; recovery, with motion.*

Elizabeth Bruen, æt. 16. Admitted to Bellevue Hospital, Jan. 29th, 1864. Her father died of phthisis. In 1862 she sprained her right ankle. The injury produced a chronic form of inflammation, and in two months it had increased so much that she could bear no weight at all upon it. She now moved about by hopping on the well (left) foot, and in about six weeks, she had excited the same form of inflammation, in that one as in the other. Two years after the first injury, when admitted to the hospital, her appearance was cachectic and miserable. The disease in her ankles had gone on to the formation of abscess, and several sinuses led into the joint, through which disintegrated bone had escaped.

The gastrocnemii of both sides were so contracted as to extend the foot nearly to a straight line with the tibia. She could not

[1] Young subjects, who are not so heavy, can walk without the aid of crutches. But with adults, or very heavy children, there is danger of tearing the plaster, or breaking the instrument, and, therefore, crutches are necessary to take off the superincumbent weight.

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bear the slightest pressure on either foot, and could not use crutches, as she could not poise herself on the ends of her toes, which were the only points that could touch the floor when in the erect posture. She was, therefore, compelled to move about upon her knees, as seen in Fig. 9, which also shows the sinuses connecting with either joint.

Fig. 9.

All active disease about the joints had subsided; but the discharge from the various sinuses was considerable, and by probing them, several small pieces of bone escaped.

On the 17th of February, 1864, in the presence of the class at Bellevue Hospital, I divided subcutaneously the tendo-Achillis on both sides, and restored the feet to their natural angle with the legs. Leather splints were then applied, to retain them in this new position until I could have a pair of instruments manufactured, which I am in the habit of using to extend the ankle-joint.

This instrument consists of a firm steel, or hard rubber plate, made to fit the sole of the foot; at the heel is a hinge-joint, and attached to it a rod, slightly curved at the bottom, and extending up the back of the leg to near the knee. Over the instep is an arch, like the top of a stirrup, with a hinge joint at its summit from which springs another rod, which runs in front of the leg, of equal length with the one behind. These rods are made with a male and female screw, or ratchet and cog for extension, and connected at the top by a firm band of sheet iron, on the side of which is a hinge, and a lock on the other like a dog-collar. (See Fig. 10.)

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The instrument is applied with firm adhesive plaster, cut in strips about one inch in width, and long enough to reach from the ankle to near the tubercle of the tibia, and placed all round the limb, as in Fig. 11.

Fig. 10.

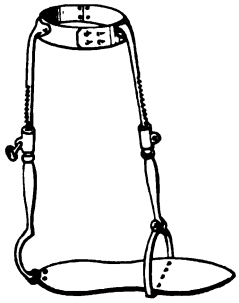


Fig. 11.

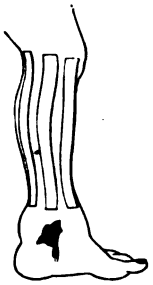
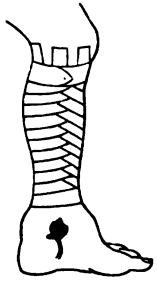


Fig. 12.



The plaster is secured in its position, to within an inch of its upper extremity, by a well adjusted roller, as seen in Fig. 12.

The instrument is fixed, and the foot firmly secured by a number of strips of adhesive plaster, as seen in Fig. 13. A roller should be carefully applied over this plaster to prevent its slipping, and the ends of the plaster at the top of the instrument turned over the collar, which has been previously locked, just tight enough to be comfortable, and secured by a turn or two of the bandage, as seen in Fig. 14.

Fig. 13.

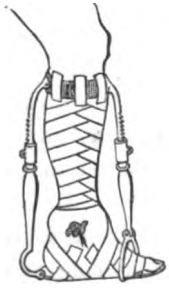


Fig. 14.

On the 24th of February, just seven days after the section of the tendones Achillis, these instruments were applied in the presence of the class at Bellevue Hospital, in the manner above described.

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The sinuses were enlarged, and a seton of oakum drawn through the ankle-joint, as indicated in Figs. 11, 12, and 13. A wad of oakum thoroughly wet in cold water was placed over each ankle, and secured by a firm roller. The screws were extended, and the difference in the appearance of the ankle before and after is well represented by comparing Figs. 13 and 14.

These drawings were taken from life by Dr. Henry C. Eno, House Surgeon of Bellevue Hospital, and are as accurate as any photograph could be.

As soon as the instruments were properly adjusted, she stood upon her feet, without the aid of crutch or cane, for the first time in two years, and without any pain whatever; but the instant the screws were shortened, the pain was most intense.

She was directed to have the oakum around the joints kept constantly wet with cold water, and firmly supported by a bandage and changed as often as necessary. The seton was to be pulled through, and the soiled part cut off daily, and to be continued as long as any bone was exfoliating, until the matter should change from its sanious condition to a consistent pus, when it was to be removed, the wounds allowed to heal, and, if possible, passive motion made. If motion could not be attained, then the feet were to be anchylosed in their natural position, deeming that a stiff ankle was better than an amputation.

The following notes of the case, copied from the hospital records, which were taken by Dr. Irving W. Lyon, House Surgeon, now of Hartford, Connecticut, will show the progress and the result of the treatment:—

"*February* 28. She is very comfortable, and there is no pain about the ankles.

"*March* 15. Has been out of bed most of the time since the operation; but remained sitting at the bedside until to-day, when, with the aid of crutches to balance the body, she walked about bearing her *entire weight* upon the feet; the extension made by the instrument being so perfect as to prevent pressure upon the joint surfaces.

"*April* 6. Apparatus removed from both feet, and motion made at the ankle-joints, which are perfectly free and movable, but pressure is yet *very painful*. The apparatus is reapplied. It should be stated that the patient was put upon the best diet the hospital could afford, together with cod-liver oil and iron.

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"*May* 7. The adhesive plaster having become disarranged, necessitated its readjustment. It was now discovered that the sinuses had all closed completely; but pressure while extension was off still gave her some pain. Her general health very materially improved.

"*July* 20. All extension being removed, she is able to stand erect without pain in either ankle; but attempts at walking occasion a considerable amount of pain and uneasiness. The motions of the ankles are all unimpaired. Her health is thoroughly restored, and she has not only grown taller since her admission, but has also grown much more fleshy, and will weigh at least thirty pounds more now than in February. The splints are reapplied, and will require to be worn a little while longer to complete the cure."

In a foot-note I find the following record: "It should be mentioned that since the 15th of March (the date of her commencement to walk upon the shoes) she has continued to walk upon her feet, bearing the entire weight of her body upon them, and only needed crutches to supply the place of the muscles of the leg, which, on account of being confined by the apparatus, were unable to balance the body."

Dr. Lyon left the hospital about this time, and I can find no further notes of the case on the records of the Institution. She wore the instruments, however, until about the middle of January,

Fig. 15.

Fig. 16.

1865, when they were permanently removed, and a plaster cast taken of both her legs and feet, from which Figs. 15 and 16 are copies. The motions are almost perfect, and she can walk without pain.

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CASE IV. *Caries of the ankle-joint; seton; recovery.*

B. W., aged 7, of healthy parents, and whose brothers and sisters were all healthy, had himself always enjoyed good health, until in the summer of 1854, when he injured his left ankle by a fall.

The joint swelled immediately, and was quite painful; but still did not confine him to his bed until after four or five days. It then became so painful as to prevent motion, and for a number of days he was treated by perfect rest, and alternate applications of hot and cold water. As he made no improvement, after a few weeks his ankle was blistered, and this was repeated every eight or ten days for a great number of times, but without any improvement in his ankle.

His general health became much affected, with loss of appetite, and of sleep; he became greatly emaciated, and suffered intense pain constantly, which was greatly aggravated at night by frequent spasms, or "jerkings of his foot" as he described it.

The development of the leg and thigh on the affected side became arrested, the ankle and foot very much swollen and shapeless, a number of sinuses formed leading into the joint, and the bones crepitated when the joint was moved.

Dr. Valentine Mott saw him in July, 1855, and advised amputation as the only means of saving his life. The mother, however, would not consent to the operation, and I was called to see him in consultation with Dr. David Green in October, 1855. Several sinuses then existed, leading into the joint, through which the probe was passed without difficulty, but coming in contact with carious bone in almost every direction.

On the 21st of October, 1855, I opened the joint freely on either side by connecting some of the sinuses, and found the joint carious throughout.

Two setons of oakum were passed through the joint, the one laterally, and the other antero-posteriorly; and the foot extended in the instrument as in the case of Elizabeth Bruen, above described. As the seton was pulled through, a number of small pieces of bone were drawn entangled in its meshes.

When he recovered from the effects of the chloroform he could bear pressure on the foot without pain, and would permit it to be handled in any direction without complaint, although before its application he would not permit it to be touched, and it was im-

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possible to move it in any direction, even in the most careful manner, without giving him the most intense agony.

He slept quietly the night after the operation without any anodyne, although he had been compelled to use anodynes freely for many months, and never resorted to them again during the time he was under treatment.

His general health began to improve almost immediately from the time of the operation and the application of the instrument, his appetite returned, and he was able to ride out in the open air with comparative comfort. The setons were pulled through daily and the soiled parts cut off; and the whole ankle constantly surrounded with oakum saturated in cold water, and sustained by a tight bandage.

For two or three months small pieces of bone were frequently found entangled in the fibres of the seton, when pulling it through; but the discharge gradually diminished in quantity, became more consistent in character, and, as it did so, the setons were gradually reduced in size, until finally they were a mere thread or fibre. At the end of eleven months from their first insertion they were removed entirely, and the sinuses closed up in a short time after, never to be reopened.

The extension was continued for nearly two years before it was removed permanently, although he had walked about for many weeks before the instrument was removed. As soon as the sinuses had become closed and he could bear moderate pressure upon the foot, when the extension was off, without suffering pain, I commenced passive motions daily, by acting on the anterior and posterior screws alternately, thereby imitating the natural motions of the joint. In about two years from the first operation, the instrument was removed permanently, when he could walk without difficulty, having considerable motion in the affected joint. This motion has very materially increased, and is now (nearly ten years after the operation) almost as perfect as the other. The foot is smaller than the other, and about half an inch shorter, but he supplies the deficiency by a thick sole inside his boot, and can run and skate with any of his playmates without the deformity being detected.

Drs. Mott, Stephen Smith, and other surgeons of this city saw this case when under treatment, and, therefore, know that the setons passed through the ankle-joint; but as there has been some question about it, by others who have not seen the case, I have had his foot daguerreotyped on both sides by Mr. Gurney, and the cicatrices on

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either side, giving the entrance and exit of the setons, show conclusively that they did pass through the ankle-joint. (See Figs. 17 and 18.)

Fig. 17.

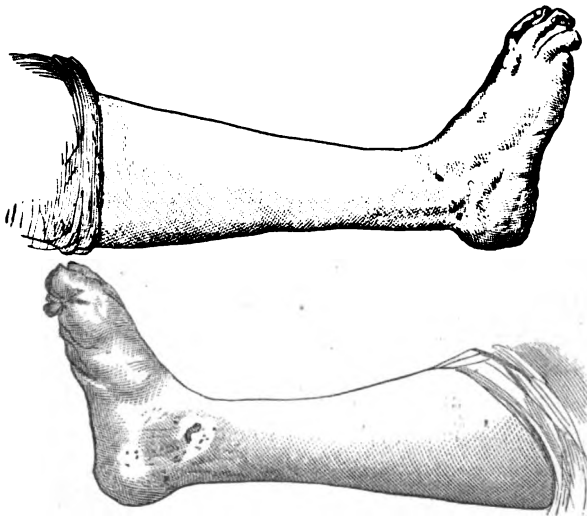

Fig. 18.

CASE V. *Suppuration and caries of the ankle-joint; operation; seton; extension; recovery with motion.*

In January, 1855, I was sent for by Dr. L. C. Ferris to amputate the leg of Ella Stanley—aged 5 years—for disease of the right ankle-joint. In March, 1854, ten months previous, she had fallen from a chair, striking her right ankle against the sharp corner of a bedstead. The injury was immediately followed by considerable swelling and very great pain. The pain soon subsided, but the swelling continued.

For two or three weeks she seemed tolerably well, but at the end of that time she began to limp badly. She was then put upon crutches, and various lotions applied to the foot and ankle.

The disease, however, continued to progress, her general health became much affected, with loss of appetite and sleep, and she was greatly emaciated. The limb was much smaller than the other, but the foot and ankle were swelled into a shapeless mass. In November she began to have repeated chills and hectic fever, and in the early part of December the ankle opened in several places, giving exit to a large amount of ill-conditioned or strumous pus.

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Her general health became much impaired, and in January, 1855, I was sent for to amputate the limb. Her suffering was most intense; she would not permit the limb to be handled until she was under the influence of chloroform, when crepitus was readily detected; several sinuses around the joint discharged quite freely a curdy pus mixed with a material very much resembling quince-jelly.

A probe passed into one of these sinuses, just posterior to the internal malleolus, went into and through the joint, making its exit at a point in front of the external malleolus. A strip of linen (in default of anything better) was torn from the child's dress, passed through the eye of the probe, and drawn through the joint.

A piece of firm sole-leather, cut to fit the front of the leg, and dorsum of the foot, having been thoroughly soaked in cold water, was then applied over the top of the foot, and secured by a nicely-adjusted roller; the foot was firmly extended so as to separate the tibia and astragalus, and the roller then carried up the leg, over the leather, which, when dry, served to extend the joint and at the same time prevent all motion. This gave her great relief, and her limb could be moved with comparative comfort. The child was put upon the most nutritious diet, with quinine, cod-liver oil, and iron.

The dressings were removed and changed as often as they became soiled with pus, and in the progress of the case, compression with sponges and cold water was resorted to. Her improvement was most marked and rapid. At the end of a few weeks the instrument was applied, as in the other cases, and with the same happy results, enabling the patient to walk with crutches and obtain the benefit of out-door exercise, which added materially to the improvement of her general health.

The setons were retained nearly ten months, being gradually reduced in size as the bone ceased to exfoliate and the pus became more healthy, until for a number of weeks they were hardly larger than a single thread. When they were finally removed, the sinuses healed in a few days, and passive motion was commenced as in the other cases. The patient continued to wear the instrument for nearly a year after she was perfectly well, as a means of prevention against accident, and then left it off entirely.

It is now eleven years since this case was operated on, and she is as well in the one leg as the other, and the motions are almost as perfect. The foot is one size smaller than the other, and the leg

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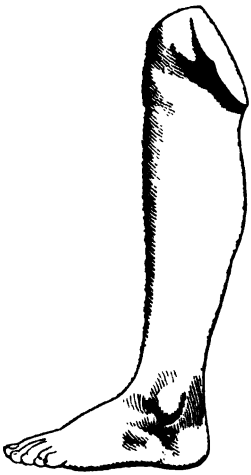
a little shorter; but the limb is perfectly developed, as represented in Figs. 19 and 20, which were taken from a plaster cast of her limb, and which also represent the cicatrices where the seton passed through the joint.

Fig. 19.

Fig. 20.



I have treated fourteen cases of the ankle- and nine of the knee-joint, where the disease had extended to suppuration, like those just described, and with equally satisfactory results, and have now under treatment two others, with setons through the joints, that are progressing favorably; but as they differ but little from those described, which I have selected as typical cases of the so-called strumous suppuration of the joint, I have not thought it necessary to report them in detail, as it is only a repetition of the same general principles of treatment, and adds unnecessarily to the length of my paper without conveying any new ideas.

I have also treated an immense number of cases of chronic inflammation of both the knee- and ankle-joints, that had not yet progressed to suppuration, by means of the instruments only, with the most satisfactory results, and have taught for a number of years that others should do the same. I will close this paper by quoting the report of a case furnished me by Dr. Robert Newman, of this city, who had treated it according to my suggestions, and, as it

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represents many other cases treated in the same way, will save the necessity of further repetition.

CASE VI. "*Chronic inflammation of the right ankle-joint; talipes equinus; operation; recovery.*

"Kate Dooley, 279 West 39th Street, æt. 17, single, presented herself in June, 1864, wishing to be treated for rheumatism. She came upon a pair of crutches, and even with these could hardly move on account of sores produced in the axillæ. She was suffering from chronic inflammation of the right ankle-joint, which had caused contraction of the muscles to such an extent as to produce the extremest form of talipes equinus. This affection had existed nearly four years, the result of a severe sprain, and the deformity had lasted two years in the same position as at present. The patient was unable, herself, to move the foot, any effort on her part to do so causing severe pain in the ankle-joint. Pressure or rotation both aggravated the pain intensely, but firm, gradual extension relieved it. Diagnosis: inflammation of the cartilages within the ankle-joint. A consultation with Dr. Sayre confirmed this diagnosis; and it was concluded to apply his splint for extension of the ankle-joint.

"*July* 19, 1864. The general condition of the patient was bad, she was very anæmic, and suffered from loss of appetite, headache, and constipation; her right foot and leg were both atrophied. The contraction of the gastrocnemius had existed so long as to render extension of it impossible without first dividing the tendo Achillis, which was accordingly done by Dr. Sayre, subcutaneously, without the loss of any blood, and the wound covered with adhesive plaster. The foot was then brought to a right angle with the leg, and the splint applied.[1]

"After the application of the instrument, the patient could stand on her feet immediately in a natural position, without any aid.

"For the next two days and nights she complained of soreness and some pain. There was scarcely any febrile movement present.

"*July* 22. She had passed a comfortable night, and felt well.

"*August* 1. She has been perfectly comfortable, and free from

[1] My usual custom is not to apply the instrument until several days after section of the tendon, or until the external wound has entirely healed; but in this case I could not make a second visit, and therefore applied the instrument immediately after the operation.

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pain since the last note, and to-day got up and walked about the room without any assistance, even of a crutch or cane.

"27*th*. The instrument was reapplied. The patient walked to my office with the assistance of a cane, and the same day went to the country.

"*May* 19, 1865. The patient has improved steadily since the last note. Great annoyance has been occasioned by the breaking of the instrument, which was not strong enough to bear her weight, and which once caused a slight relapse.

"Since October last, she has done all her own house-work, and many errands. On the 15th of May, while the instrument was being repaired, I surprised her by an unexpected visit, and found her walking about at work, with not even a bandage upon her foot. She had not the slightest pain, though after being a long time on her feet she felt very tired. All the motions of the joint were perfect; but it was thought more judicious to reapply the instrument for a few months, which was accordingly done.

"The limb has regained its natural size, and her general health is perfect."

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CASE

OF

EXSECTION OF THE WRIST-JOINT.

BY

S. H. TEWKSBURY, M. D.,
OF PORTLAND, MAINE.

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CASE OF EXSECTION OF THE WRIST-JOINT.

MR. OLIVER LEIGHTON, aged twenty-six, by occupation a teamster, had received an injury in the left wrist by lifting fifteen months previous to my seeing him. Soon a little puff appeared on the palmar surface of the wrist, but it did not give him any great inconvenience until two months previous to the operation. When first seen, the lower portion of the forearm down to the distal extremity of the metacarpal bones on the dorsal and palmar surfaces was much swollen, discolored, and, at points, fluctuating; and for two weeks had been exceedingly painful. Examination showed by an incision made on the radial side of the wrist that an extensive abscess had been formed extending three inches above the wrist and over the whole dorsal surface of the hand, with extensive caries existing in the carpal bones, lower extremity of the radius, and articulating surface of the ulna. The patient's health had always been pretty good, and his constitution did not present any marked indications of scrofula, although in early life he presented marks of a strumous diathesis. Having ascertained the character and extent of the disease, it was hard to determine upon the practicability of any other operation than that of amputation. The patient and friends, however, decidedly refused to have the arm removed, and it was agreed to excise the wrist joint.

Taking advantage of the incision that had already been made on the radial border for exploration, it was carried down one inch below the radio-carpal articulation, thence over the dorsum of the hand, through the integuments with the convexity downwards, then carried up on the ulnar side to a point parallel to the radial incision. The integuments were readily detached from the tissues beneath by reason of the extensive suppuration, but the remainder of the operation was exceedingly tedious and difficult, on account of the importance of the structures involved, and the flexor and extensor tendons with the vessels and nerves being so firmly fastened down and glued together by inflammatory deposits from the long existing disease. I succeeded, however, in removing the

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first row of carpal bones with one inch of the radius by the chain saw, and the articulating surface of the ulna by the forceps. It was not expected by myself, or any of the surgeons present, that it was possible for the hand to be preserved in the condition it then presented, being connected to the forearm by a few tendons only and a little healthy skin not over one inch in width on the palmar surface, the vitality of that on the dorsum not being able to give much support, being almost entirely destroyed by the suppuration. The hemorrhage was excessive on account of the extensive granulating surface, but no arteries required a ligature. The parts were brought into apposition as nearly as possible by sutures and straps, supported upon a splint in an easy position.

With warm water dressings to restore the lost temperature, I left the patient in charge of the attending surgeon, expecting to be obliged in a few days to complete the operation by amputation, as it seemed the parts had not sufficient vital power to resume healthy action, especially when it is remembered that the principal feature in the process of repair and cicatrization was, in this case, absent; namely, apposition of surfaces, as considerable space must exist from the present condition of the parts.[1]

Third day after operation: Wound giving indications of healing, no appearance of sloughing on any portion of the integuments except on the radial border of the flap. The metallic sutures hold the parts in apposition except at the point mentioned. Patient has suffered little pain, less than in same time previous to the operation. No sympathetic fever. The patient has some desire for nourishment.

Feb. 26. Twenty days after the operation: The patient's health has improved; wound has granulated well, and the discharge is laudable. The integuments are adherent except at two points at the inner and outer border of the wrist; the cavity is filled with granulations. There was a tendency of the hand to flex, and thereby push up the carpal end of the ulna. The hand was now fastened to the splint more firmly, extension and counter-extension were made by adhesive straps to the forearm and hand, with a compress over the projecting end of the ulna.

Two months from the operation: The wound has been healing satisfactorily, the two points of discharge still remaining open,

[1] It is necessary, perhaps, for the formation of an artificial joint that there should not be perfect apposition, especially when any of the rudimentary tissues remain, which will aid in making up a new articulating surface.

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evacuating sero-purulent fluid. He has had since last note several small superficial abscesses about the wrist. The fingers all have motion, yet the power to flex and extend them perfectly seems mostly lost. The thumb and index finger can be brought in contact by the patient. The deformity at the wrist has increased, which I attribute partly to the neglect of the patient to make the required appliances of support and extension. Medical attendance could not be conveniently rendered as the patient lived at a distance in the country.

May 28, 1865. Fifteen months after the operation: The wound ceased to discharge in July; motion at wrist about as perfect as in the other wrist, only limited in its extent of action. The hand being twisted inwards, the left lateral motion or abduction is interrupted, and also perfect extension, by the carpal extremity of the ulna projecting too prominently on the dorsum of the wrist. The thumb and fingers all have motion, but flexion is not yet sufficient to hold any small objects between them and the palm of the hand. Such objects are grasped by the thumb and index finger and by all the others by taking substances between them sufficient to hold a weight of fifteen or twenty pounds. He says that in his occupation of teamster it does not materially interfere with his duties, and he can drive as well with that hand as he ever could.

REMARKS.—In searching for the history and success of this operation, I find that it is one which does not meet with the general favor of the profession, from the fact that a majority of the reported cases have either been failures by not arresting the disease and amputation was subsequently resorted to, or the hand left in a useless condition. Erichsen says: "In whatever way performed, exsection of the wrist-joint is not a very satisfactory procedure, and in most of the cases in which it has been done, secondary amputation has been required, the wound not healing or the hand left in a useless state." Ferguson who made several operations, not satisfactory, however, to himself, says this is one of the principal exsections associated with modern surgery on which he has the least reliance, yet is worthy of further trial, for in whatever state the hand may be left, it would prove of more value than any artificial substitute. The experience of many other operators with the tables and memoranda of results are given by Dr. R. M. Hodges, of Boston. They are the most recent which I have been enabled to obtain in relation to the operation in question.

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I find a large proportion of cases in which the results are fully given, and the cases are regarded as successful; the prominent deformity is a lateral displacement or adduction, as is the condition of the one I report.

I am quite sure now that this deformity might have been obviated had the ulna been cut off on the same level as the radius, or to a sufficient amount, to have allowed a certain degree of contraction or shortening that will always occur in all exsections of joints where motion is expected to be retained. The hand is adducted by the pressure of the ulna against the remaining carpal bones, the equal resistance being lost by the absence of the carpal extremity of the radius, and thereby giving the hand an unfortunate twist, or it will partially override the bones with which it comes in contact and flex the hand, making an additional deformity of flexion with adduction.

In conclusion I am convinced that the result of this case compares favorably with the results of exsections of larger joints, and when this operation is more extensively practised with the improvements which will be made in the operation and treatment, it will give statistics of as favorable results, and be entitled, as other exsections now are, to an honorable and favorable recognition by the profession.

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ON

DISLOCATION OF THE STERNAL END OF THE CLAVICLE,

WITH A

NEW APPARATUS FOR MAINTAINING ITS REDUCTION

BY

H. D. HOLTON, M. D.,

OF PUTNEY, VERMONT.

VOL. XVI.—27

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ON DISLOCATION OF THE STERNAL END OF THE CLAVICLE, WITH A NEW APPARATUS FOR MAINTAINING ITS REDUCTION.

On the 19th of November, 1863, I was called upon to attend an American boy, seven years of age, who had been thrown from a wagon upon a rough bank covered with stones, the last wheel of the vehicle passing over the body. He was healthy and well developed for a child of his age.

On reaching the house of the patient whither he had been conveyed, distant about a quarter of a mile from the place of accident, I found him insensible—not having recovered from the concussion.

There were two severe scalp wounds from which the blood was freely oozing.

The fifth and sixth ribs were fractured obliquely directly over the heart, and the sternal end of the left clavicle dislocated forwards.

This dislocation was undoubtedly produced by his striking the point of the shoulder against the bank with so much force as to drive the sternal end through the anterior sterno-clavicular ligament, and leave it almost in front of the right sterno-clavicular articulation. In order to do this, the force must have been sufficient to rupture not only the anterior, but also the posterior sterno-clavicular ligament, the inter-clavicular, and the rhomboid.

The shoulder appeared lower, and the acromion process correspondingly approached the sternum. The attachment of the clavicular portion of the sterno-cleido-mastoid muscle remaining intact drew the head to the left side and turned the face to the right. The wounds of the scalp were cleansed and dressed in the usual manner, and a broad bandage was firmly applied around the chest. I then directed my attention to the dislocated bone. It was easily reduced by raising and carrying back the shoulder, at the same time that pressure was made upon the dislocated end; but on removing the pressure, the dislocation returned, and I was forcibly reminded of an anecdote related to me by my venerable preceptor,

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the late Prof. Mott, of New York. When Mott was a pupil of Sir Astley Cooper, a man one day presented himself with a dislocation of the clavicle at the sternal extremity. Sir Astley requested Mott to reduce it. He did so, but on removing his finger, the dislocation returned. He then requested him to keep it reduced; Mott replied "that he could not." "Neither can I," was the rejoinder of Sir Astley; and this has been the history of these cases, both with ancient and modern surgeons, for Chelius and Malgaigne both speak of the deformity that remains after a cure has been effected. Prof. Hamilton, in his work on *Fractures and Dislocations,* says: "Not one of the four forward dislocations of the clavicle seen by me has been completely reduced, or, if reduced, they have not been retained in place."

The dislocation returning whenever the pressure was removed, it became evident that it was only to be retained by continued pressure. For that purpose, I devised the apparatus, to which it is the object of this communication to call your attention.

It consists of a piece of spring steel, curved so that the extremities may be brought together like the blades of a pair of forceps. To the anterior one is attached a pad which is applied over the joint after the dislocation is reduced; the posterior blade is longer, and curved to fit the scapula.

The apparatus now being in place, pressure is made by means of a screw which passes through, about an inch and a half from the curved extremity, and which may be turned at pleasure. It is retained in place by means of tapes passed through perforations in the free extremities, and which are attached to a perineal band. This keeps it from slipping up. It is retained in its perpendicular

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position by means of a brace which passes and is attached to a band going round the shoulder. This band serves the double purpose of an attachment for the brace, and, with the strap passing posteriorly to the other shoulder, a means of drawing the shoulder back. The arm should then be placed in a sling and confined to the side by means of a bandage.

This apparatus was thus applied, and the patient continued to wear it for four weeks, when it was removed. The arm was, however, retained in a sling for a couple of weeks longer.

This treatment was *perfectly successful.* There is no deformity, and the shoulder is not weakened.

It is, therefore, claimed for this apparatus, that it supplies what has long been wanted for the successful treatment of these cases, to wit, a firm, steady, and continuous pressure over the sternal end of the clavicle, for the reduction must be continuous for four or five weeks, in order to give the lacerated ligaments an opportunity to become thoroughly repaired; since every time the bone escapes, the process of reparation must begin anew.

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PRACTICAL OBSERVATIONS IN OPHTHALMOLOGY.

BY

E. WILLIAMS, M. D.,

OF CINCINNATI, OHIO.

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PRACTICAL OBSERVATIONS IN OPHTHALMOLOGY.

In volunteering a paper for the consideration of this Association, I have tried to make it, as far as possible, of a practical character, embodying mainly my individual experience. By introducing different topics, also, I have hoped to excite a more general interest among those members specially, if not exclusively, occupied in ophthalmic practice.

STRICTURE OF THE NASAL DUCT.

Only a few years ago, ophthalmic surgeons were not only dissatisfied, but almost disgusted with all the then known methods of treating dacryo-cystitis and stricture of the nasal duct. It was at this period that Desmarres revived the old method of obliterating the lachrymal sac. His results, and those of others after him, were brilliant compared with the almost uniform failures of the numberless devices of his predecessors for restoring the natural passages by dilatation. As a disciple of Desmarres, I was for a number of years, a zealous advocate of occlusion of the sac by cauterization with the ferrum candens or the chloride of zinc. For mild cases, however, this treatment was too severe, and attended occasionally by serious accidents; while other methods were deplorably inadequate. In the midst of this general longing for something better, the genius of Bowman struck out a new path which has led eventually to most gratifying results. In harmony with the spirit of modern surgery, he persisted in the conservative efforts to remedy and restore, rather than destroy. He originated, and first put in practice, the simple and happy idea of gaining free access to the sac and nasal duct by slitting the canaliculus.

His plan of operating and system of stiles are so well known that I need not detail them here. Suffice it to say, that it opened up a new channel, and created a new era in the history of diseases of the lachrymal passages.

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Bowman's treatment was beneficial in most instances, and successful in many; but relapses in a few months or years after the cessation of the use of the stiles were frequent. I believe, with others, that these failures to produce permanent relief were due to insufficient size of the stiles and inefficient medication. It is, I believe, an established fact that stricture of the urethra is much less likely to relapse, if the dilatation is carried to the *utmost capacity* of the canal. In my judgment, the same is true of the nasal duct.

Dr. A. Weber, in the *Archiv für Ophthalmologie* (1861), reviews the whole subject of treatment by Bowman's plan; gives a summary of the results really attainable by it; its short-comings in many cases, the reasons of this, and his own modifications of the method. He deviates from Bowman in three important particulars. First, he enters the sac by laying open the superior instead of the inferior canaliculus. Secondly, he uses much larger instruments for dilating the stricture. Thirdly, he substitutes gum-elastic and wax bougies for the metallic. Finding that such large instruments could not be easily introduced by simply slitting up the canaliculus, he at the same time incises the sac and the *ligamentum mediale*, subcutaneously. For this purpose, he devised a delicate probe-pointed knife, curved upon the back, which can be readily passed through the puncture. The operation is performed as follows: The little knife is made to traverse the punctum and canal, till the probe-point enters the sac, the upper lid being made tense by drawing it upwards and outwards against the edge of the orbit. The handle is then depressed till the canaliculus is divided down to the sac. Then the knife is pushed further down into the sac by raising the handle towards the glabella, and turned so that the cutting edge presents forwards and outwards. Then, by pressing the skin at the inner canthus with the index finger of the left hand against the edge of the instrument, and making a little sawing motion, the sac is incised and the internal palpebral ligament partly divided subcutaneously. Both for slitting the canal and notching the sac, this knife is, by all odds, the best instrument I have ever used.

For exploring the sac and duct, thus freely opened from the conjunctival surface, Dr. Weber uses graduated conical silver probes. They are made double, like Bowman's stiles, one end smaller and the other larger. The small one begins with a bulb, after which it increases in thickness till, at the distance of an inch and one-eighth from the point, it reaches one line. The other com-

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mences with Bowman's No. 6, and increases to the size of an eighth of an inch. With the smaller of these he enters the sac, and makes his exploration, ascertaining the situation and character of the stricture. If the stricture is membranous and elastic, he lays aside the silver explorer and uses the smallest elastic bougies, somewhat conical at the point. After a few days, a larger one may be passed through the stricture, and so on up to No. 9 or even No. 10 of the urethral bougie scale, finishing the treatment with wax bougies in the course of three or four weeks. Should he find the stricture narrow and callous, or complete atresia, he then, after injections for a few days with tepid water, forces the obstruction with the silver probe and dilates it at once to the size of Bowman's No. 6, by pushing the conical probe through it. Afterwards he finishes the dilatation with the elastic bougies as before. He thus dilates the duct to its utmost normal capacity. He introduces the bougie for a short time every day as advised by Bowman.

As topical applications, on which Weber justly lays great stress, a solution of zinci sulph., cupri sulph., or plumbi acetat. is daily injected after the cavity is washed out with tepid water. Where there is abundant purulent secretion, he uses a solution of sulphate of copper of ten to twenty grains to the ounce.

After a faithful trial, first of Bowman's and afterwards of Weber's method, I have adopted a combination of the two, with certain modifications of my own. My results for the past two years have been so uniformly successful, that I venture to give it publicity, so that it may be fairly tested by others.

I follow Weber in choosing the upper canaliculus, and practise the opening of the sac essentially as he directs. I then enter with the large one of his conical silver probes, search for the stricture, and pass it, easily if I can, forcibly if I must. If I find that the obstruction yields at all easily, I push the instrument clear down to the nose, thus dilating it almost or quite to the full capacity of the nasal duct at the first sitting. Bleeding from the nose after its withdrawal generally occurs, and sometimes it will be quite profuse. Should the stricture prove to be firm and rigid, I force it with Bowman's No. 5 or No. 6, leave it in a few minutes, and have the patient return next day, when, if not too painful, it is passed again and left in half an hour or more. In the course of four or five days, usually, the stile can be worn all the time. For about the first week, I wash out the sac with tepid water daily after removing the stile, the water, of course, passing freely into the nose.

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The best syringe for this purpose is the small gutta-percha, bent at a right angle about half an inch from the point. My object is to get the patient to wearing the *stile* as soon as it can be tolerated, instead of only introducing it for half an hour or so each day, as practised by Bowman, Weber, and others. Most patients will be able to do so in from four days to one week; while a few very irritable subjects must be coaxed along for two weeks before they can bear it day and night.

For wearing, I have had a series of five silver stiles made by Mr. Wocher, of Cincinnati. The smallest with which I always commence is marked No. 5, and is in size larger than Bowman's No. 6. They are marked 5, 6, 7, 8, 9, and correspond in size to the same numbers of the bougie scale. No. 5 has a diameter of one-sixteenth and No. 9 one-eighth of an inch. Where Bowman *leaves off* the dilatation I *begin*, and go up to the full capacity of the duct, which is usually about 9. After letting the patient wear No. 5 two or three days it becomes loose, so that the next larger can be substituted, and so on up to No. 9, which is usually attainable in from two to four weeks. The stiles are from 1¾ to 2 inches long, slightly conical at one end and flattened at the other, and gently curved. They should be long enough so that when passed down to the floor of the nostril, the flat end will extend about ¼ inch above the inner canthus and rest on the skin of the upper lid. The upper flattened end can be bent forwards a little, or in any other direction to make it comfortable. In fact, I now bend them very much down, just where they enter the sac, so that the flat end hooks down over the lower lid and rests on the skin below the inner canthus, the curve thus coming between the puncta, and all traction and inconvenience avoided. The smaller numbers, especially, if not bent sufficiently, are liable to work down and disappear in the sac. This has occurred to me twice, and gave me some trouble and anxiety. In one man, my No. 5 worked down and was *swallowed* during sleep. I charged him to keep a sharp look-out for it, and just four days afterwards, with a little obstetrical assistance, it passed his bowels.

During the whole treatment, the stile is taken out daily, the sac first washed out well with tepid water, and then injected with a solution of twenty grains to the ounce of sulphate of copper. The length of time the patient is made to wear No. 9, after it is reached, depends upon the amount of secretion and the dilatation of the sac. As long as there is any perceptible discharge of mucus

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from the lining of the sac, the stile and injections should be continued, the latter being made less frequent, or weaker as the case improves. It is astonishing to see how rapidly the blennorrhœa and enlargement of the sac disappear under this treatment. In most of my cases, I have finished the treatment and abandoned the use of the stiles in about six weeks. Some are obliged to wear them longer. The great advantages, as I conceive, and have found by actual experience, in my method of causing the patient to wear the stile constantly are, that patients suffer much less, get well quicker and better than when it is only introduced for a short time each day. I am now having gutta-percha stiles, of the same model and sizes, made by Tiemann, of New York. I think they will be an improvement on the silver ones, because of their greater elasticity and lightness.

Recently Mr. Critchett, in his lectures on this subject, recommended stiles of the *laminaria digitata* or *sea tangle* for dilating strictures of the nasal duct. When dry, the stem of this sea-weed is smooth, elastic, and possessed of the admirable property of expanding rapidly when moistened. Mr. Critchett has four sizes made, of the common length of ten centimetres, and varying in diameter from 1.2 to 2 millimetres. The important point in the use of these, is to judiciously control the dilating power which we possess in that substance. If such a stile was passed tightly through a stricture and left twenty or thirty minutes, it would be impossible to extract it without doing violence, in consequence of the expansion below the stricture. Of course they must be made sufficiently small and not left in too long. In the *Klinische Monatsblätter für Augenheilkunde* for March and April, 1865, there is an article from Dr. Weber in which he sets forth the advantages of the stiles of laminaria digitata, and says he has now abandoned the use of gum and wax bougies, in their favor. He has constructed five stiles embracing the two extremes of Critchett. Besides these, he uses conical ones for certain cases. He finds by experiments that when immersed in *warm* water, they expand to nearly double their diameter in from ten to thirty minutes, according to the size. Dr. Jaesche, of St. Petersburg (A. f. O. vol. 10, 2d part), has lately suggested cutting the sac *directly downwards*, after slitting up the lower canaliculus, as less painful than the method of Weber. For myself, I do not see how this procedure is any less severe, and it is open to serious objections. He likewise recommends the division of narrow strictures by a stricture knife,

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and perforation of atresia by the same means. Weber also prefers this to forcing the obstruction, and thinks there is much less danger of making a false route when the knife is used. For my own part, I believe just the reverse is true, if the stricture is forced by a large stile, such as No. 6, which filling up the nasal duct cannot readily deviate to either side, and pass under the mucous lining. Since I have used large stiles for forcing obstructions, I have had no difficulty from false passages.

As to the stiles of sea tangle, I have not yet used them and do not see much necessity for their action. For producing sufficient dilatation to allow the patient to wear the silver or gutta-percha stiles, instead of forcing and dilating at once with a metallic or other probe, they may be useful. I shall give them a fair trial, and hope they may be found an improvement. For the whole treatment by my method of wearing the stiles constantly, this substance is not at all applicable, on account of the long-continued and, towards the last, very irregular expansion.

Quite lately I have seen in the *Annales d' Oculistique*, a review of a pamphlet recently published by Manfredi, in which he elaborates the alleged discovery of Sperino, of Turin, that the *surest way* to *re-establish* the *permeability* of the lachrymal passages, is to *obliterate the sac!* In plain English, the best way to *open a* hole is to *stop it!* If tear sacs, and nasal ducts, and strictures are got up in Italy differently from what they are here, that remarkable suggestion may embody the entire philosophy of their therapeutics. Where the suppuration does not rapidly subside after the stricture is opened and injections used for a few days, Weber recommends artificial ectropium of the lower punctum by the use of collodium, or of a ligature opposite the punctum as it is used for the relief of entropium. This prevents the tears from entering the sac and keeping up the irritation. In the normal position of the lids, the tears are mainly absorbed by the lower punctum. Those who wish to study this subject more particularly, I would refer to the sources above indicated, and to the *Cincinnati Lancet and Observer* of November, 1864, and June, 1865.

PARACENTESIS CORNEÆ.

This little operation is a most valuable means not only of relieving pain, but very often of rescuing vision when in imminent peril. A broad, very sharp needle with a small probe on the opposite end

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of the handle is the best instrument for the purpose. Désmarres' paracentesis needle is too broad, difficult to introduce, and more painful. I have, therefore, abandoned its use.

The operation is performed as follows: The lids being held well and firmly open, and the eye supported on the inner side with the fingers of the operator, so as to prevent its rotation inwards as much as possible, the needle is passed through the cornea at the outer side about a line from its margin and parallel with the plane of the iris. When the point has fairly entered the aqueous chamber, as indicated by its increased clearness, the handle may be depressed towards the temple and the needle gently withdrawn, so that the aqueous humor may not escape too suddenly and bring the iris and lens against the point. The better way, however, is to suddenly withdraw the needle by a little jerk. In this way little or no fluid escapes till the wound is made to gape by pressing upon its external lip with the end of the probe. As the humor trickles out, the iris, supported by the lens, advances till it comes in contact with the cornea.

The most pain is felt just as the evacuation of the chamber is completed. Although, with me, this little operation is of daily occurrence, and has been for years, I have never met with any serious accident from it. I always make slight pressure upon the closed eye with charpie or a compress, immediately after the evacuation, to prevent hemorrhage into the interior chamber from the sudden cessation of the natural tension. If this does take place, the blood is soon reabsorbed, and nothing serious results. I seldom find it necessary to fix the eye with the forceps during the puncture, or to give chloroform except in children.

The two classes of cases in which I have found paracentesis an invaluable remedy, are those of ulceration of the cornea with or without hypopium, attended by great pain; and of iritis or iridocyclitis. There is nothing that will so certainly stop the progress of an ulcer of the cornea towards perforation on the one hand, and lateral destruction of tissue on the other, as the relief of tension by a puncture. The pain, which is often most intense, is relieved in a very few minutes, and the ulcer begins to heal. The peculiar action of atropine, and its curative effects, are also very much favored by the operation. In all cases of corneitis with ulceration, attended by hypopium, or by severe pain that does not promptly yield to the topical use of atropine, I resort to paracentesis. It always relieves the suffering promptly, and does vastly more, in my judg-

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ment, to rescue the eye than any other single remedy. I repeat it once or twice a day, as often as the extreme tension of the eye and the pain, with increase of hypopium are reproduced. I treated a lady recently who had a deep sloughing ulcer near the superior margin of the cornea, extending about one-fourth of the way round. The anterior chamber was nearly half full of pus, and the woman had had no refreshing sleep for more than a week on account of extreme pain. The eyelids were granulated and swollen, and there was every reason to believe the eye would be lost. The patient's other eye was totally blind from chronic glaucoma. In her case, I made a paracentesis every day for two weeks, and sometimes twice a day. For some hours, and usually for nearly a whole day after each puncture, the suffering was relieved, the pus partially disappeared, and the progress of the ulcerative process was checked. As soon as they began to revive, I operated again, and so on until the disease was mastered, perforation of the cornea prevented, and the woman rescued from impending blindness. Of course I used atropine very energetically, and gave the patient anodynes and other treatment internally; but evacuation of the aqueous humor was the only thing that exercised any manifest control over the progress of the disease. So immediate and palpable was the relief after each operation, that the woman would send word at once, when the eye began to pain her anew, for me to come and repeat the paracentesis. In cases of phlyctenular keratitis, so common in children, with ulceration and hypopium, where the active local use of sulphate of atropia in the eye, and mild purgation followed by free doses of quinine internally, do not check the increase of the ulcer and diminish the amount of pus in the anterior chamber, I do not remember ever to have failed to produce a decided improvement by one or more punctures of the cornea. Even if it does not prevent perforation, which it nearly always does when resorted to early and frequently enough, it diminishes the extent of the destruction of the cornea, and leaves enough of it clear, to admit of the formation of an artificial pupil afterwards if necessary. Of course where the ulcer has nearly perforated, great care should be taken to avoid causing a sudden rupture and prolapsus of the iris by too much pressure on the globe during the operation. As a rule, puncturing the cornea in the thinned bottom of the ulcer itself should be avoided, on account of the risk of too sudden escape of the humor. For several years past I have been in the habit of making paracenteses with most gratifying effects, in obstinate or very severe

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forms of iritis. If free local depletion by leeches applied to the side of the nose opposite the inner canthus, and the energetic use of atropine—four grains of the sulphate of atropia to the ounce of water dropped into the eye every two or three hours—do not decidedly improve the symptoms in one or two days, I evacuate the aqueous humor. Almost without exception, the disease is checked by the first puncture, as is indicated by the more marked dilatation of the pupil, cessation or great amelioration of the circumorbital pains, increased clearness of the aqueous humor, and diminution of the redness of the globe. If these return in twenty-four or forty-eight hours, I repeat the paracentesis. It is seldom necessary to operate more than twice, and once often suffices to check the severity of the inflammation and bring it under the control of the other remedies mentioned above. In my hands it has proved the best antiphlogistic I have ever tried in such cases. I remember very particularly a soldier whom I treated for acute syphilitic iritis in the Marine Hospital. In the very incipiency of the attack, I had leeches used, and resorted to frequent instillations of a solution of atropine. On the evening of the same day, the pain being excessive, I gave him half a grain of morphine with two grains of calomel, and repeated it in four hours. The next morning, thirty-six hours from the commencement of the attack, I found he had not slept for the pain; there was extensive chemosis; intense pericorneal injection, and so much exudation of lymph from the iris that the whole anterior chamber seemed filled with it. The pupil was very smoky, and the patient could scarcely discern the hand before him. I made a paracentesis at once. As the point of the needle entered the anterior chamber it carried the tough lymph before it, detaching it from the iris, causing the latter and the pupil, as I pushed the needle still farther, to appear in their natural color. After withdrawing the instrument and producing complete evacuation of the aqueous humor by pressure with the probe, nothing was used but the atropine. During the day he got a good sleep, and in the evening all the symptoms were much better. That night he rested well. On the next morning the pain recommenced, but was not so severe. I repeated the puncture with prompt and complete relief, and in ten days' time all the lymph was absorbed; the pupil largely dilated and free from adhesions, and the sclerotic again white and natural. The eye recovered perfectly and permanently. A similar case occurred to me since, after a needle operation for secondary cataract. A shred of the lacerated membrane

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came in contact with the margin of the pupil and caused an inflammation which spread rapidly to the whole iris. Great pain, intense injection, and enormous exudation of lymph came on in twenty-four hours, in spite of free leeching, atropine, and large doses of morphine. I punctured the cornea, when the same detachment of lymph, as it was engaged and carried across the chamber by the point of the needle, was observed. Decided amelioration was effected, but in twenty-four hours the pain returned with another increase of the smokiness of the aqueous humor. The operation was repeated daily for five days, and the inflammation rapidly disappeared, the lymph was absorbed, and the pupil again became clear as it was just after the operation. I speak particularly of these two cases because of their extreme violence and their ready control by paracentesis after the most heroic leeching and application of atropia had failed to modify the inflammation in the least degree. In iritis, with hypopium, paracentesis is still more urgently indicated. In the obstinate chronic forms, with extensive synechia posterior, repeated evacuation of the aqueous humor will generally relieve the inflammation; but to prevent relapses and effect a permanent cure, iridectomy, according to Graefe's recommendation, is by far preferable.

In cyclitis (inflammation of the corpus ciliare), either acute or chronic, I have also frequently resorted to oft-repeated paracenteses with very satisfactory results. The first case of the kind was that of a young woman whom I treated, some eight or nine years ago, for chronic cyclitis. After having been for some two months, under the local use of atropine, with tonics and alteratives of all sorts internally, I commenced puncturing the cornea, and quit everything else. At first it was done every day, then every second, and finally every third day, as the case improved. She was so sensitive that I was obliged to put her under chloroform each time, and I evacuated the humor in all nineteen times. The eye recovered, and is well to this day.

Since that time, I have treated several milder cases and one more severe of the same kind, with the same good results. In chronic iritis and in cyclitis, hemorrhage into the anterior chamber after the evacuation is more likely to take place, and immediate pressure to prevent it is necessary.

As to paracentesis in glaucoma, sclerotico-choroiditis posterior with myopia, retinitis, choroiditis, or incipient cataract, I think it should be discouraged. Glaucoma is not amenable to anything but

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thorough iridectomy. The posterior staphyloma of myopia will not yield to it. Besides, in this affection destructive hemorrhage into the retina, or vitreous humor, is very liable to supervene just after the operation. In choroiditis and retinitis its use is of doubtful propriety; while the curability of incipient cataract by paracentesis repeated hundreds of times, is not admitted except by the zealous Italian Sperino, who recommended it. It is mainly, if not exclusively, in the diseases I have mentioned, that paracentesis corneæ should take, as I think, high rank.

THE UNGUENTUM CITRINUM RUBRUM, OR BROWN CITRINE OINTMENT.

This preparation is not found in the U. S. Pharmacopœia. I have had it made from a recipe found in an old edition of Wilde on the ear. He advised its use in chronic inflammation of the lining membrane of the external meatus. For some eight years I have been in the habit of prescribing it, to the exclusion of all other mercurial salves, for blepharitis marginalis and for phlyctenular conjunctivitis and keratitis. It is very soft, adhesive, melts quickly by the natural warmth of the eye, produces little or no irritation when used on the diseased lids, or in the eye, and acts most admirably in this class of cases, especially after the acute symptoms have begun to subside. I have it applied in the pure state once a day; if to the lids, at night. In the eruptions about the nostrils, behind the ears, and on the scalp, so common in scrofulous children, and generally complicating the phlyctenular inflammation of the eyes, or blepharitis marginalis, or both, there is nothing that acts like it. By the thorough and daily use of warm water and soap, to soften and remove the scabs from the head, the hair of course being cut short, followed by the free use of this salve applied and confined by a night-cap, I have cured a number of most inveterate cases of favus and other scabby formations on the scalp.

It is, in my experience, a very valuable preparation, especially in the class of diseases I have mentioned. It is prepared very much in the same way as the common citrine ointment, except that cod-liver oil is substituted for the neat's-foot oil used in that process. I have heretofore published in the *Lancet and Observer*, the method of preparation, and the special advantages which it possesses over other mercurial unguents. It is admirably prepared by Prof. E. L. Wayne, northwest corner of 4th and Vine Streets, in Cincin-

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nati. I herewith present a specimen of this salve, as also of the amylum-glycerine paste, containing a grain each of the sulphate of morphia and the sulphate of copper to the drachm of the vehicle. I vary the strength of the copper from one to fifteen grains to the drachm in the treatment of granulated eyelids, and other forms of conjunctivitis. It is a very convenient and a very valuable combination.

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ON

FOREIGN BODIES IN THE EAR,

WITH A

BIBLIOGRAPHY AND A CONDENSED STATEMENT OF THE PRESENT CONDITION OF AURAL SURGERY.

BY

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AURAL SURGEON TO HOWARD HOSPITAL, ETC., PHILADELPHIA.

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FOREIGN BODIES IN THE EAR.

A SHORT time ago a young man presented himself to me for treatment—being entirely deaf, and only made to understand by writing—the difficulty being the result of a piece of straw in the ears. The case made a deep impression upon my mind, and I am glad of the opportunity of bringing it before the profession through the Association. According to my judgment, the simplest, and I hope therefore the best method for the removal of foreign bodies from the ear is the use of the syringe. It is true that, in some rare instances, a foreign substance may remain in the ear for a long period without producing severe injury, or but slight deafness; yet, in the instance referred to, and in many others which have come under my notice, foreign bodies have given rise to inflammation of the meatus auditorium, resulting in deafness; also acute and chronic inflammation, with thickening, and even perforation of the membrana tympani, followed by aural polypi, and even terminating in delirium, convulsions, and death. The following is a list of the foreign bodies which have come under my notice, either introduced accidentally or intentionally: Beads, shells, pins, needles, pieces of paper, wool, cotton, human hairs, bullets, bits of straw, pebbles, buttons, grains of corn, and insects, both dead and living. The means of extraction which have been, and are still recommended in most of the works on general surgery, and in our journals, are not the most simple, but rather complicated, and often prove injurious, so that failure generally results, to the mortification of the physician and injury of the patient. For the comfort of those who have not succeeded in the extraction of a foreign body from the ear, it is related that the late Sir Benjamin Brodie failed to extract a pea from the ear in a case, which he relates in a report of a clinical lecture published in the *London Lancet*, January 6, 1844: "There was a case brought into the hospital in which there was some foreign body, I believe a pea, in the external meatus. *I tried all sorts of methods to get it out.* I could not use

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the forceps, and it nearly filled up the meatus, so that neither water could pass behind it, or it was so jammed that the water injected by the syringe would not wash it out. I said, let it alone, let it remain there; the pea, in all probability, will dry and waste of itself, and then it will come out, or when it is decayed it may be washed away with a syringe; but I will not make any further efforts to remove it now, for I may drive it into the tympanum and kill the patient."[1]

The number of instruments which have been recommended by different writers are very numerous, such as probes, hooks, scoops, curettes, &c. My distinguished friend, Professor Gross, is of the opinion that he has invented an instrument which he believes to be perfect. "It is composed of steel, is about five inches and a quarter in length, very light and delicate, cylindrical and somewhat rough at the middle—to afford a good hold for the thumb and fingers—spoon-shaped at one extremity, and furnished with a little tooth or prong at the other. This tooth, which projects at a right angle from the shank of the instrument, is exceedingly small, and therefore admits of easy insinuation between the foreign substance and the auditory canal. The curette or spoon is also very delicate and bent considerably more than the ordinary cataract curette. (See Fig. 1.) To facilitate the use of this instrument,

Fig. 1.

chloroform is administered to the extent of entire obliviousness. This," he states, "is absolutely necessary when the patient is a child, or a nervous, excitable adult."[2] Our objection to this instrument is, that it is made of steel, and, consequently, not being flexible, cannot be altered in shape to suit the circumstances of the case. I am one of those who have seen and tried almost all the ordinary mechanical contrivances, and have come to the conclusion that the syringe stands first for the removal of all kinds of foreign bodies, and all other aids are secondary. This opinion is based upon a great many years' experience. It is the easiest and safest

[1] See also a similar case in "Defects of Sight," by T. Wharton Jones; edited, with additional remarks on "Defects of Hearing," by the Author. Pp. 177. Philadelphia, 1859.

[2] American Journal of the Medical Sciences, Oct. 1864, p. 394.

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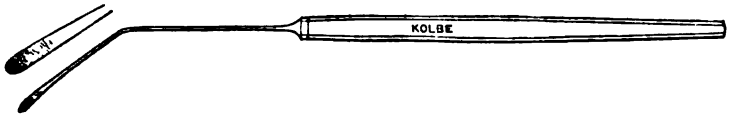
method, no matter whether the foreign body be large or small, light or heavy, irregular or even, occupying a small space or plugging up the meatus entirely, of recent introduction or of long standing. I have never failed with this instrument, alone, or in conjunction with a soft silver probe (Fig. 2), curved, as seen in the cut, the flat

Fig. 2.



end of which, as well as its shaft, can be accommodated to the varying conditions presented in these cases. I would advise this instrument to be made also of hard rubber, as it is less apt to injure the delicate mucous membrane. The probe I find alone the best instrument for the removal of foreign bodies from the nose; but only secondary in the case of the ear, the syringe being first. In two cases which occurred recently of a bead and a button in the nose I succeeded in removing them with the probe.

The use of the syringe is not of recent application, but the credit of calling the attention of the profession to its universal applicability for the removal of foreign bodies from the auditory canal is due principally to Mr. Carpenter,[1] of Castle Comer, Ireland. "The first case," he observes, "brought to me some years back, was one in which the foreign body was a garden pea, which, as is usual, was pushed in as far as the tympanum by the interference of the child's friends. The instrument I selected was a very small forceps, with blunt points, with which I could catch the pea, but could not move it, and on endeavoring to do so, caused intolerable pain. It immediately occurred to me to inject cold water with force, in order to at least displace the pea. I did so with a two ounce syringe, and found the pea so far displaced as to lie at the orifice of the meatus, whence I removed it without further trouble or pain to the child. Since that I have extracted many peas in the same way." About six months after, he extracted a pebble which was of so irregular a shape and so large that he was surprised that the child could have borne to introduce it—the meatus was not inflamed, but the pebble was so far in and wedged in its place, that to touch it ever

[1] American Journal of the Medical Sciences, Jan. 1842, p. 231; Dublin Medical Press, June 10, 1841.

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so lightly with any instrument was almost enough to throw the child into convulsions. The first injection failed; but while using a second, the pebble, much to his satisfaction, was forced on the napkin held under. On another occasion he removed a grain of oats by the same method.

Dr. James Bolton[1] has related a case, interesting both in its history and result, which occurred in a girl aged 13, "in whose meatus auditorius a grain of coffee had remained for seven years. He syringed the ear with warm water and Castile soap. On throwing in about the third syringeful, with some force, a black-looking substance shot into the basin, which, on examination, proved, beyond all doubt, to be the half of a coffee grain."

Mr. Edward Halfield[2] removed from the ear of a boy by this means a piece of slate pencil, which had been pushed further in by the school-master in a fruitless attempt to extract it.

Samuel Cooper[3] relates the case of "a child two years and half old into one of whose ears a pebble and into the other a French bean had been pushed by another child, and remained there for ten months, causing complete deafness and extreme suffering." By throwing tepid water forcibly into the ear he soon dislodged these foreign bodies, which lay close against the tympanum, entirely hidden by the swollen state of the lining membrane of the ear, indurated wax, and dried discharge.

Dr. J. Marion Sims[4] gives the following illustrative cases of the ease, safety, and certainty of this method of removing foreign bodies from the auditory canal.

Case I. A little negro boy, four or five years old, was sent to Dr. B. R. Jones, of this county, Montgomery, Alabama, with a piece of cut-glass in his left ear, and his master had made some fruitless attempts to extract it with a knitting-needle. The meatus was swollen, inflamed, and very tender. I happened to be at the doctor's at the time. We made many ineffectual efforts to get this substance out, using a bent probe, scoop, and forceps. We also used a syringe, but with the view of washing out some coagula of blood, the result of our awkward and clumsy poking with unsuitable instruments. The injury inflicted by our rude attempts

[1] Medical Examiner for 1842, p. 613.
[2] New York Edition London Lancet, July, 1844, p. 97.
[3] Cooper's Surgical Dictionary, Art. Ear.
[4] American Journal of the Medical Sciences, April, 1845, pp. 340, 341.

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at extraction was by no means trifling. After a second attempt on the following day with a pair of long, narrow-bladed, curved forceps with no better success, and just before giving the case over in despair to "bleeding and general antiphlogistic course," I picked up the syringe for the purpose of washing out a coagulum of blood that was hanging from the meatus. I threw in two or three syringefuls of tepid water, but the exuded blood still stuck there. I then requested Dr. Jones to take hold of the external ear and pull it outwards, upwards, and backwards, so as to make the canal straight and allow me to see into the meatus. He did so, and I injected forcibly. My astonishment was equalled only by my delight at seeing the glass "ear drop," as it proved to be, shoot out with great velocity on the steps of the door in which we had the patient. It was five lines in length, a little over three in width, and nearly two in thickness, slightly flattened on one side and oval on the other. Its peculiar shape precludes the possibility of holding it between the blades of the forceps even now. Its size, in connection with the tumefaction of the meatus shows that it must have been perfectly impacted, and I doubt very much whether it could have been removed at that time by any other instrument.

Case II. A little negro girl, who was sent by Dr. Hugh Henry, with a foreign substance in her right ear. It gave her some pain, but as there had been no useless and mischievous probing of the meatus, it was trifling in comparison with that suffered by Case I. I caught hold of the external ear with left hand, putting it strongly on the stretch, so as to make the meatus a straight channel, while with the other I threw a syringeful of tepid water forcibly against the tympanum. A single injection was sufficient to dislodge the foreign substance so far as to make it easy of access. It was a portion or segment of a berry of the China tree (*Melia azedarach*).

Case III. Was a negro man, Lewis, aged twenty-eight, who had been deaf, with discharge from his ear, from a cherry-stone, which was removed by the same means. It filled up completely the bottom of the meatus, and was perfectly impacted and quite immovable, and, from his history of the case, must have been in the ear for more than twenty years.

I will only relate a few cases, selected from many, occurring in the writer's hospital and private practice.

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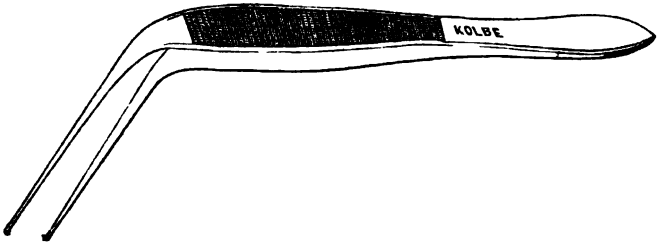
CASE I. *A Button in the Ear.*—June 7th, 1863, a physician brought to my office in the afternoon a boy, aged six years, who had placed in his ear a gilt button about ten o'clock A. M. His parents upon discovering it, took him soon after to this physician's office, who, after trying with several forms of forceps, hook probe, etc., found himself unable to extract it. He then called in a second physician, who, on an examination, would not attempt its extraction for fear of doing more injury to the meatus, which was bleeding, swollen, and very tender. On examination with a speculum and bright light, I could discover the button on the membrana tympani, its eye being towards me in an upward direction, but bloody and flattened, so as to prevent my passing a hook or wire into it. I therefore desired the physician to take hold of the external ear and pull it outwards, upwards, and backwards. While he did so, I injected forcibly a continuous stream of tepid water, which changed its position so as to bring it to that portion of the canal so that I could seize it with a pair of forceps, which are shown at Fig. 3, a modification of Wilde's.

Fig. 3.

My only objection to Wilde's angular forceps is that they do not take a secure hold, being apt to slip; they also twist when much strain is placed upon them, which is not the case with my modification. Wilde's forceps are seen at Fig. 4.

Fig. 4.



CASE II. *Pebble in the Ear.*—May 17th, 1864. Agnes R., aged five years, while playing with pebbles from a sand heap, placed

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one of them in her right ear. It remained there for some time, when she became alarmed, and upon inquiring of one of her companions if it would kill her, she replied in the affirmative. This girl then confessed to her mother what she had done, who was much alarmed, and took the injured girl to their family physician, who tried to extract it, but, owing to the child's restlessness and screaming, he only inflicted injury on the meatus, without being able to extract it. On the 18th, she was brought to the Howard Hospital, and, owing to her fears and the excited state which she was in, it was considered best to place her under the influence of a mixture of ether and chloroform, which I had before recommended in such cases[1] in 1859. On examination, nothing could be seen but coagulated blood, but after the use of the injection of tepid water, as before described, the pebble was washed out without pain or the knowledge of the child. A soothing application was then applied to the ear, and the case discharged.

CASE III. *A Grain of Indian Corn in each Ear for Four Years.*—March, 1865. Robert B., aged six years, was brought to the Howard Hospital by his mother on account of deafness in both ears since the age of two years. The mother could give no information in regard to the cause. It was not the result of cold, measles, or scarlet fever. On examination with a speculum and bright light, some foreign body was discovered in the ear, covering the membrana tympani. The parts were carefully syringed, and in one of the ears was found a mass of softened Indian corn. A second and even a third injection was employed and a similar softened grain of corn was found in the opposite ear. The hearing was improved after some further treatment, but the membrane in both ears was rendered opaque from the pressure of the Indian corn for so many years.

The following cases are from "Toynbee,"[2] and were removed by the same means.

CASE I. *Slate-pencil in the Ear of a Child.*—J. S., aged 7, was brought to me at the St. George's and St. James' Dispensary, on Nov. 28, 1849, her mother stating that she had pushed a piece of slate-pencil into the right ear. She had not complained of pain, and

[1] Defects of Hearing, chapter ii.; Foreign Bodies in the Meatus, p. 178; in Wharton Jones' Defects of Sight, Phila., 1859.

[2] Cases of Foreign Bodies Removed from the External Meatus, p. 71.

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had not slept well. Upon examination, by means of the speculum and lamp, a rough piece of slate-pencil was observed lying on the floor of the meatus, one end being apparently in contact with the membrana tympani, while the other looked towards the orifice of the meatus. It was easily removed by the syringe and warm water, and found to be nearly half an inch long and a quarter of an inch broad. The patient did not complain of pain, and in a few days the membrana tympani was healthy.

CASE II. *A Percussion-cap in the Ear for fifteen years.*—C. E., aged 26, was admitted at St. Mary's Hospital in November, 1852. She said that lately she had felt somewhat deaf in both ears. Upon examination, a mass, like hardened wax, was observed near the orifice of the left meatus. It was removed by the syringe, and proved to be a percussion-cap surrounded by wax. The patient said that she remembered when about eleven years of age, she put a cap into her ear, but she believed it had been taken out, and never thought of it since. The membrana tympani was concave, the Eustachian tube natural, and the power of hearing was nearly gone.

CASE III. From the same authority, showing the injurious effects from the use of instruments in the removal of foreign bodies from the external meatus.

"*A shell in the meatus; removal by instruments; paralysis of the portio dura nerve.*—Miss A., aged 14, consulted me in May, 1853, on account of complete deafness of the right ear, and paralysis of the right side of the face. Her father stated that eight years previously she had, in play, put a small shell into the ear; that the surgeon in endeavoring to remove it, forced it deeper into the ear, breaking the shell, and causing intense pain. After its removal there was much discharge from the ear, and in a few days the muscles of the right side of the face lost their power, which they have not regained. Upon examination there was no vestige of the membrana tympani; the mucous membrane of the tympanum was very thick and red, and there was not the slightest power of hearing."

As an agent to assist the syringe in the removal of a shell from the ear there is nothing better than a delicate bent wire. By this means shells have been removed with great facility at the Howard Hospital by hooking the bent wire into the opening of the shell; but when they are flat, the reflex of a stream of water brings them near enough to be seized with a pair of angular forceps.

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I will not occupy the time and attention of the Association further in the relation of cases, but will now state the opinion of a few of the most distinguished aural surgeons of the present age, namely, Wilde, Toynbee, and Tröltsch.

Wilde[1] states that "rude efforts made to extract foreign bodies from the ear are as likely to cause mischief as these bodies themselves. The simplest and often the most effectual means of removing small substances from the meatus, is by syringing the meatus with plain warm water."

Mr. Toynbee observes that "the syringe and warm water are, as a general rule, quite sufficient to remove all rounded solid bodies. I have succeeded in extracting beads and other hard substances, which appeared to be impacted in the meatus by means of the syringe only, though a good deal of time is occasionally required."[2] It may at times be useful to move the body slightly by means of a probe a little bent downwards so as to facilitate the passage of the water to the back of it; for the mode by which the syringe acts, is in forcing the warm water inwards behind the foreign body, and thus gradually expelling the latter outwards. Mr. Wilde and other writers recommend the use of the curette, spatula, or forceps, in the extraction of extraneous substances from the meatus; but I have rarely been obliged to use any of these instruments, and resort to them should be avoided if possible. Dieffenbach, who advocated the use of a curved director or curette, must have met with cases showing the practice to be dangerous; for he says, "Should violent bleeding supervene, and there be no likelihood of completing the operation at one sitting, cold and afterwards warm applications are to be resorted to, to prevent suppuration." It is also almost impossible to pass a curette between the extraneous substance and the meatus without impelling that substance inwards, in which case it is very apt to be pressed forcibly against the membrana tympani and cause inflammation. Cases are sometimes met with in which the most lamentable results have followed attempts at removing foreign bodies by instruments. Death itself has not unfrequently happened; and where the life of the patient has been spared, the ear has sometimes been destroyed and the portio dura nerve paralyzed.

[1] Practical Observations on Aural Surgery. By Wm. R. Wilde, Philadelphia. p. 183.

[2] The Diseases of the Ear, by Joseph Toynbee, F. R. S. Philadelphia, 1860. p. 69.

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Dr. Von Tröltsch[1] has well observed, "We can scarcely believe what ridiculous and laughable expedients have been suggested for the removal of foreign bodies from the ear. Thus the well-known Itard recommends leaving seeds in the ear till they have sprouted, and the removing them by the sprouts. Bermond (1834) reported that he had removed a bean by placing a leech upon it. Rau,[2] from whom I take the last example, considers it as calling to mind the experience of Arculanus (1493) who recommended to put the head of a freshly-killed lizard in the ear. Three hours after the insect would be found in the mouth of the lizard. There are also a great number of forceps, nooses, perforators, etc., for the removal of foreign bodies from the ear, some of them of very complicated construction, and their number does not diminish even at this day. It is true that there is considerable room between the figure of a bead and the oval or ellipsoidal contour of the auditory canal, so that a small lever can be introduced under the offending body. In such cases, however, injected water will also collect behind the body and wash it out, or dislodge it so that the removal can be completed with my angled forceps."

The translator of Von Tröltsch's work[3] makes the following observations "in regard to the adequacy of the method of syringing for the removal of foreign bodies from the ear. I have yet to meet with a case of failure (and I employ no other means) in an experience reaching over a considerable variety of cases. During the last ten months "at his Ear Clinique (New York Eye and Ear Infirmary) he has caused the removal of plugs of impacted ear-wax in twenty-eight cases. Dr. J. H. Hinton, surgeon to the same institution, has had forty-five cases, and makes a similar statement as to the efficacy of syringing in his cases."

Under the word *extraneous* as suggested by a learned and esteemed deceased friend,[4] I will add a few remarks on the collections of cerumen in the meatus. These occur from two different causes: first a primary affection of the ceruminous glands; and secondly, from secondary and sympathetic derangement of the deeper-seated cavities. Our rule in the Howard Hospital

[1] The Diseases of the Ear, by Dr. Anton Von Tröltsch, New York, 1864. p. 47.

[2] Text-book for Diseases of the Ear. Berlin, 1856. p. 376. "Lehr Buch der Ohrenheilkunde."

[3] Dr. B. St. John Roosa, "American Journal of Medical Sciences," January, 1865. pp. 104, 106.

[4] Dr. Wm. Darrach.

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is first to examine the ear, with the conical speculum of Wilde (see Fig. 5) with sun light or a reflector and lamp; if found to

Fig. 5.

contain an excess of cerumen, the assistant is directed to introduce sweet oil into the meatus, and to retain it for twenty-four hours by closing the external orifice with a clean plug of cotton. The ear is then carefully washed out with an elastic injecting syringe (see at Fig. 6) and warm water; the tube is narrowed so as

Fig. 6.

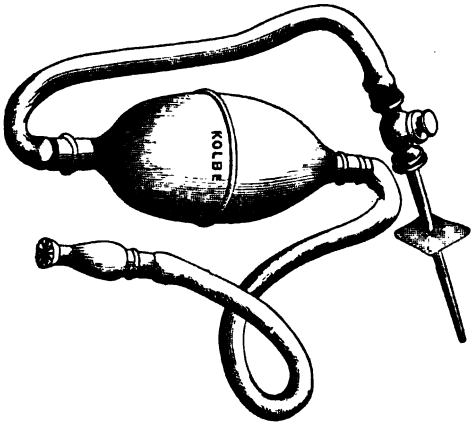
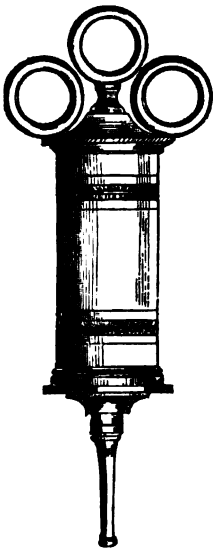


Fig. 7.



to pass in and yet allow any foreign matter to pass to one side of it in the water. If the elastic syringe is not at hand, resort may be had to form at Fig. 7. The patient is again subjected to an examination by the surgeon, and if any of the cerumen remains it is removed with the soft silver or hard rubber spatula (Fig. 2) bent at an angle so as not to interfere with the light. The advantage of the oil is that it softens the plug, never gives cold like water, and

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destroys any living body within the ear. We very seldom find it necessary to repeat the syringing more than twice. By this method many hundreds of cases have been relieved during my service of ten years, and in no instance have we failed in removing the offending body. In a recent case the author removed a plug of accumulated hard and indurated cerumen from the ear of one of the Vice-Presidents of our State Medical Society (Dr. E.), which had remained there for four years, and which had been pronounced by a most distinguished surgeon an exostosis, so hard was it, that when struck it sounded like bone.

One of the most important considerations is that we must never in any case employ much force; everything must be done with the greatest regard to ulterior results, and as all the usual mechanical contrivances may disappoint us, and even the syringe may fail, let us not do more mischief with our instruments than would happen if after careful and delicate manipulation we are compelled to let the foreign body remain.

RETROSPECT OF THE PROGRESS MADE IN OTIATRICS DURING THE LAST ELEVEN YEARS.[1]

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[1] H. Schwartze Schmidt's Year Book.

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A most valuable scientific monograph on the diseases of the ear. A list of Toynbee's original papers will be found in the appendix to his work.

2. Bonafos and Lazurnu: Otorrhœa; Death; Induration of the Inferior Peduncle of the Cerebellum. Ann. par Jamain et Waker, p. 219.

3. Toynbee: Ante Caries of the Tympanic Cavity. Med.-Chir. Trans., p. 217.

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3. VOLTOLINI: Post-mortem Appearances in the Ear of the Deaf and Dumb. Virchow's Archiv, vol. xxxi., No. 2. This is the fourth series of autopsies, consisting of 19 cases. Voltolini dwells much upon the importance of making a more exact examination of the labyrinth.

4. GRUBER: Cases of Necrosis of the Petrous Bone. Wien. Allg. Zeit.. Nos. 41, 43, 45. An extraordinary and unique case is given, in which the cochlea, with a portion of the wall of the tympanum, were discharged from the meatus of each ear, the boy recovering.

5. KRAMER: Criticism on Politzer's Mode of removing Obstruction of the Eustachian Tube. Deutsche Klinik, No. 34.

6. SIEGLE: Pneumatic Ear-Speculum. Ibid., No. 37. A new instrument for determining with exactitude the amount of mobility remaining in the membrana tympani.

7. GROSS, S. D.: On Extraction of Foreign Bodies from the Ear and Nose. Amer. Journ. of the Med. Sci., Oct. This instrument consists of a delicate, light cylindrical bar of steel, five and a half inches long, somewhat roughened at its middle to afford a good hold, spoon-shaped at one extremity, and having at the other a very small tooth or prong, projecting at right angle from the shank.

8. HILTON'S "Two Cases of Chronic Impairment of Hearing improved after Scarlet Fever and Erysipelatous Sore Throat," and an account of the "Dissec-

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tion of the Ear in a Case of Deafness." The dissection of the ear is in a case of death suddenly during an attack of rheumatic fever, after having been deaf for sixteen years. Guy's Hospital Reports, Third Series, vol. x. London, 1864.

9. Pagenstecher: On Trephining the Mastoid Process and Petrous Bone. Arch. f. klin. Chir., iv. 523.

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22. Brenner: On the Use of Galvanism. Loc. cit., vol. xxviii. p. 197.

23. Hinton: Improvement in hearing Voice, but not in hearing Watch. Med. Times and Gaz., 1863, ii. 644.—Case. Guy's Hospital Reports, x. 340.—On Insufflation of Alum in Chronic Catarrh of Meatus, &c. Med. Times and Gaz., 1864, i. 11.

24. Ruschenberger, W. S. W.: Description of a Syringe for Washing the Auditory Canal. Amer. Journ. of the Med. Sci., vol. xlviii. p. 86.

25. Follin: Case of Trepanning the Mastoid Process. Gaz. des Hôp., 1864, p. 4.

26. Triquet: On Bleeding from the Ear. Loc. cit., p. 26.

27. Gruber: On the Diseases of the Muscles. Wien. Med. Halle, 1864, p. 36.

28. Böke, J.: On Cancer. Loc. cit., 1863, pp. 428, 438.

29. Hutchinson, J. H.: Hysterical Loss of Speech and Hearing successfully treated by the Inhalation of Ether. Amer. Journ. of the Med. Sci., vol. xlvii. p. 412.

EUSTACHIAN TUBE.

30. Politzer's Method of Inflating the Tympanum. Med. Times and Gaz., 1864, i. 10.

31. Kramer, W.: On the Introduction of Fluids, &c., into the Tympanic Cavity. Deutsche Klin., 1864, p. 113.—On Politzer's Method of Inflating the Tympanum. Loc. cit., p. 325.

32. Hermann, A.: On a New Mode of Catheterizing. Wien. Med. Halle, 1864, p. 339.

33. Anderson, T. McCall: A Short Sketch of Obstructions, &c. Glasgow Med. Journ., xii. 1.

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MEMBRANA TYMPANI.

34. Politzer, A.: On the Artificial Membrane. Wien. Med. Halle, 1864, p. 5, &c.

35. Schreiber: On Perforations. Loc. cit., pp. 323, 342.

36. Siegle, E.: The Pneumatic Ear-Funnel (an instrument that, by exhausting the air in the external meatus, draws the membrana tympani outwards). Deutsche Klin., 1864, p. 363.

37. Gruber, J.: On Myringodectomy. Allg. Wien. Med. Zeit., 1864, p. 305, &c.

38. Dardel: Anomalous Condition of the Internal Ear in Congenital Deafmutism. Schweiz.-Zeitschr. f. Heilk., iii. 155.[1]

ON THE ADVANCEMENT OF OUR KNOWLEDGE OF DISEASES OF THE EAR DURING THE LAST ELEVEN YEARS.

On looking over the list of the works of authors on the diseases of the ear which I have collected, it will be noticed that Wilde, of Dublin, is not only first upon the list, but he is also first in the value of his contributions to the practical knowledge of the subject. The want of a simple instrument to examine the *external meatus* and *membrana tympani* was one of the greatest hindrances to a knowledge of their diseases. That want was most admirably supplied by him in his modification of the conical specula of Gruber. With this simple yet complete instrument, made of three or four different sizes, the glass reflector of Tröltsch, and a lamp, we can determine the presence or absence of foreign bodies in the ear, tumors of various kinds, inflammation of the surface of the membrana tympani, see from whence come the various discharges, and make all the necessary applications with precision and success. Following in the footsteps of Wilde, we have the truly scientific investigations and dissections of the ear by Toynbee, who has thrown a flood of light upon the obscure pathology of this organ. Although Kramer was the pioneer in this most obscure branch of our art, he now, alas! turns his back upon true scientific progress, ignoring the pathological knowledge gained not only by Toynbee and Wilde, of England, but also by his own countrymen, Tröltsch, Voltolini, Politzer, Erhard, Schwartze, Lucae, and Weber. By the investigations of Toynbee we are made acquainted with the double function of the chain of bones, and that they are subject to inflam-

[1] A Year-Book of Medicine, Surgery, and their Allied Sciences, 1863 and '64, for New Sydenham Society, London, 1864 and '65.

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mation, ulceration, fracture, and anchylosis. Dr. Menière has published, as will be seen by my list, a most interesting case of fracture of the malleus.

Of the true nature and morbid condition of the *Eustachian tube* much has been discovered. It has been proved that it ought to be open only during the act of swallowing; and that if it by any means remains open permanently, it is one of the most troublesome forms of disease. By the use of Toynbee's otoscope and a simple gum-elastic tube we can diagnose many of its diseases, and therewith save the patient the annoyance of the introduction of a silver catheter into the nose. Still, we cannot lay aside entirely the Eustachian catheter, as benefit may be derived in the proper cases by its introduction, and through it we may pass into the middle ear watery vapor and other agents, so as to act therapeutically upon its surface. We have had confirmed, by two independent sets of experiments, that mucous collections in the Eustachian tube, as far as they may be contained within its trumpet-like expansion, may be easily removed by the forcing or blowing of air by means of the catheter; also that elastic bougies may be passed into the cavity of the tympanum through the catheter inserted into the Eustachian tube, with benefit, in cases of stricture.

The *tinnitus aurium*, or ringing in the ears, was stated before the time of Wilde as a certain evidence of nervous deafness; now we know that it often arises from disturbance of the nervous system, anæmia, and frequently from the peculiar arrangement of the bloodvessels, or a little mucus in the Eustachian tube.

Having before spoken of the utility of the speculum for the examination of the external meatus, it is found of still greater value when we look at the changes in form, color, curvature, and movement of the membrana tympani; for with this speculum and a good light no physician ought to say, as they often have said, "I never have seen the membrana tympani." With the same means we can be sure of the presence of bony or sebaceous tumors, also see at a glance if there are polypi present; and we know now that if the latter are found, they are often symptomatic of deeper-seated disease of the ear. They are, however, to be removed, and the system put under proper treatment. Instead of stating that there is inflammation of the membrana tympani, we know, by the peculiar character of the pain and a careful examination, whether it is the dermic, fibrous, or mucous membrane. By the dissections of Toynbee, Shaw, and Hinton, of London, it has been discovered that

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disease will extend from the tympanic cavity to the labyrinth, and thence to the medulla oblongata and base of the brain; therefore it is our duty to give an exit to all pus or other matter contained within the cavities of the ear, so as to prevent their extension. By the operation of perforating the mastoid cells, we have frequently relieved the patient and saved the ears, as may be seen by reference to our papers before published. "In short, it may be said that we are now so far acquainted with the structure and pathology of the ear, that, in cases of disease and deafness, we are at present enabled to particularize the tissue affected and the nature of its affection, and also to point out the proper treatment. Doubtless the subject of the diseases of the ears is still beset with many difficulties; indeed, it is one requiring so great and so prolonged attention, that it is probable, at least for some years to come, surgeons will be required to devote themselves solely to aural surgery; but we contend that this branch of surgery has been raised to the dignity of a true scientific study."[1]

[1] A Vindication of the Present State of Aural Surgery. By a Member of the New Sydenham Society. London: John Churchill & Son. 1865.

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REMARKS

ON THE

EXPERIMENTS AND OBSERVATIONS OF BELL, MAYO, AND OTHERS,

ON WHICH THE

DOCTRINE OF SENSITIVE AND MOTOR NERVES WAS CHIEFLY FOUNDED.

BY

BENJAMIN HASKELL, M. D.,
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REMARKS ON THE EXPERIMENTS AND OBSERVATIONS OF BELL, MAYO, AND OTHERS, ON WHICH THE DOCTRINE OF SENSITIVE AND MOTOR NERVES WAS CHIEFLY FOUNDED.

At a meeting of the Massachusetts Medical Society, held in 1856, an essay was read by me in which I ventured to call in question some of the received opinions on the functions of the brain and nervous system, and gave an outline of a different view, which had suggested itself to me, and which I still regard as the true one. The ideas of Sir Charles Bell, in particular, in regard to sensitive and motor nerves, I endeavored to show had been too hastily adopted, and demanded reconsideration. It is my purpose to-day to present a brief review of the experiments and observations on which that doctrine was founded, in the hope that it may obtain a place in the proceedings of the Association.

It will be borne in mind by my audience, that the means relied on to prove these conclusions were of two kinds, viz., palsy of the muscles, in connection with certain nerves, when the continuity of those nerves was interrupted by injury or disease, and the ability to produce contractions of the muscles, or to give rise to pain when the divided ends of the nerves were irritated. The first of these procedures I regard as legitimate; the second is open to serious objections. To infer, because irritating the cut end of a nerve in connection with a muscle, is followed by contraction of that muscle, that the normal and voluntary contractions of muscles require the intervention of a similar nerve affection, is but an hypothesis. To infer, because irritating the cut end of a nerve, in connection with a muscle, is *not* followed by contraction of that muscle, that that nerve has nothing to do with its physiological contractions, is but another hypothesis, the fallacy of which is even more conceivable than that of the first. For let us suppose, what all will admit is a very natural supposition, that the contraction, when it takes place, depends on some physical force propagated along the nerve to the

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muscle. Now let us suppose two nerves, one having its whole peripheral extremities in muscle, while its central join the spinal cord; the other having a part only of its peripheral extremities so ending, while the remainder, and perhaps a greater part, is distributed to the skin. This nerve exposed to physical impressions from without transmits them centripetally; while the other and the muscular portion of this last, whatever dynamic action it experiences, comes from the spinal cord. It is easy to conceive that a habit would be formed of transmitting centripetally in the one case, and centrifugally in the other, physical impressions made on each nerve. And it is easy to conceive that a nerve so distributed may give rise to contractions of the muscles, as in the experiments of Magendie on the posterior spinal nerves, or may not, as in those of Mayo on the fifth, and yet be employed by the mind in both sensation and motion. Now, suppose again both of these nerves cut, and their cut ends irritated, they would repeat the action they had been habituated to do. The nerve terminating wholly in muscle, would transmit a physical impression to it, producing contraction. While the compound nerve would have no disposition to do so, and the muscle would remain passive; but this would be no proof that the nerve in its natural state was not concerned in muscular contraction. The bare possibility of such a reaction of the nerve, as just stated, is sufficient to invalidate all those experiments which have been brought forward to prove that nerves are non-motor.

But we are not limited by this supposition. It is stated by Longet that it is often found impossible to excite contraction of the pupil by irritating the third nerve, yet nothing is better established than that it influences the motions of that part. A single fact of this kind is of more value than any number of hypotheses.

The only evidence, therefore, which is relevant to the question, is that which goes to show that the power of the mind is lost or impaired, when the nerve connecting it with the central organ is injured or diseased. And this test I propose to apply to the experiments and observations detailed by Bell and his followers, to prove the sensitive and motor properties of the nerves.

It is well known that Sir Charles deprecated the experiments of Magendie and others, on the anterior and posterior cords of the spinal marrow, as too contradictory in their results, and appealed to the fifth nerve, which he considered the analogue of the spinal nerves as affording the most substantial proof of his theory.

The first of his published experiments on the fifth, he regarded

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as conclusive. In it, he laid bare and divided its superior maxillary branch. He says: "*The side of the lip was observed to hang low, and it was dragged to the other side.* The same branch of the fifth was divided on the opposite side, and the animal (an ass) was let loose. He could no longer pick up his corn. *The power of elevating and projecting his lip, as in gathering food, was lost.* To open the lips the animal pressed the mouth against the ground, and at length licked the oats from the ground with his tongue. The loss of motion of the lips in eating was so obvious that it seemed a useless cruelty to cut the other branches of the fifth."

Here we find expressed in strong language that the conclusion drawn by Sir Charles from his first experiment was, that the fifth was a nerve of motion. How he came afterwards to withdraw that conclusion, and to append, in a note, that what he attributed to loss of motion was, in reality, due to loss of sensation, is a mystery! "A mystery," the key to which is given in the narrative of the Discoveries of Sir Charles Bell, by Alexander Shaw, where it is stated that the experimenter believed, at the time the experiment was made, that the non-ganglionic, or motor portion of the fifth, as he called it, distributed fibres to the middle branch of that nerve; and it was not until he became aware of his mistake that he accommodated the fact to his theory.

Supposing the sense of touch was lost; the senses of sight and smell were left. A horse or an ass does not need the sense of touch to enable him to pick up his food. He elevates his lips and opens his mouth before he feels with his lips the food before him, and is probably more directed by the sense of smell than by all the other senses together.

This change of opinion is rendered still more surprising from the fact that Sir Charles has himself given an example of the substitution of one sense for another in the case reported by him of a woman who, having lost the sense of touch in one arm, could hold her child by it only when she had her eye fixed upon it. Now if a woman without the sense of touch could hold her child by turning her eye upon it, why could not an ass, without touch, pick up oats if he could see or smell them?

Mr. Herbert Mayo has the credit of repeating the experiments of Bell, and correcting the inferences drawn from them, contesting, indeed, with him the honor of being the discoverer of the true functions of these nerves. With regard to the respective claims of these gentlemen, I hazard the assertion, that where they agree,

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as they do in making the nerves exclusively motor and sensitive, they are both wrong; and where they disagree, as they do (or rather did) in respect to the respiratory and masticatory systems of nerves, Sir Charles is much nearer the truth than his corrector. To the positive testimony of Sir Charles, that, after cutting the superior maxillary branch, the corner of the mouth was observed to hang low and be drawn to the opposite side, Mayo opposed the negative evidence that it was not observed in his experiments.

Again, Sir Charles having cut the portio dura, and corn and hay being given, the animal ate without the slightest impediment. This experiment is regarded inconclusive by Mayo, because the nerve was not cut on both sides. But it is difficult to imagine, if the portio dura is the sole muscular nerve of the face, how there should be no impediment at all to the animal's eating when it was severed on one side only.

Sir Charles further says: "I have found, in an individual, that, when the cheeks and lips were twisted by paralysis, he possessed a power of holding by the lips, independent of the seventh."

In another case, of a little girl with paralysis of the right portio dura, reported by Mr. John Shaw, when she was told to try to laugh with the right side, she would raise the angle of her mouth, but by an action which is evidently regulated by the fifth pair.

Thus we have, direct from Sir Charles Bell and those intimately associated with him, the double proof of the motor power of the fifth nerve over the mouth and lips, viz., the loss of power when its own branches are divided, and the continuation of that power when the only other nerve, to which this power can be attributed, is paralyzed.

In opposition to these experiments and pathological observations, Mr. Mayo details six experiments, two in which the portio dura was divided, and four in which the fifth was divided, to show that the former is the sole motor nerve of the face, and that the latter, with the exception of its non-ganglionic portion, is exclusively sensitive. In two of the four experiments on the fifth, he acknowledges that the under lip fell from the teeth, and admits, moreover, in three which he examined after death, to see if the division was complete, a filament from the fifth had joined the seventh before the division. He seems to rely almost wholly on irritating the cut ends of the nerves to prove his points, a mode of philosophizing which I trust has had its day in physiology; or if it is still destined to override, as it hitherto has done, all other means which nature

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has so bountifully provided to enable us to attain the truth in these inquiries, will continue to reward the labors of the authors of those cruel mutilations by keeping them "*wandering in endless mazes lost.*"

Admitting the fifth to take part in the movements of the lips, it is not the only nerve employed by the mind in those movements. The seventh has probably an equal, perhaps a greater share in them, on principles advocated by Bell himself. The cause of the palsy witnessed in the cases referred to may be the embarrassment in the mind's action consequent on the severing of *one* of its avenues of communication with the muscles, and may be variable in its extent and duration; may even be observed in one instance, and not in another. To be sure, if nature had made an arbitrary arrangement of the nerves into sensitive and motor, then the phenomena should be constant, and there would be some reason in regarding Mayo's non-observation as an offset to Sir Charles' observation. But that is the very point in dispute, and it must not be assumed in order to judge of the experiments when the experiments were instituted to decide that. And since the only other point which he makes against Bell's original conclusion is, that he is unable to excite contractions in muscles by irritating the ends of nerves in communication with them, which we have already seen to be valueless, the experiments themselves must be regarded as inconclusive, and we must look to the only source of positive information as to the functions of the nerves.

That the loss of muscular power consequent on destruction of a nerve or nerve-centre is due not to the impairment of a property or endowment inherent in the nervous organ itself, but is to be attributed, as above stated, to the embarrassment which the mind experiences on suddenly being deprived of one of its media of communication with the muscles, like the disruption of a train of association, is made evident by the result of some experiments recently performed by Dr. Dalton on pigeons, and recorded in the *American Journal of the Medical Sciences* for Jan. 1861. It has long been considered established that the office of the cerebellum was to combine the muscular movements in co-ordination in standing, walking, etc. Now, this gentleman removed two-thirds of the cerebellum in a number of pigeons, with the result at first of destroying this power, as might be supposed. But, after a time, those birds which survived the immediate effects of the operation were found gradually to recover the power of standing and walking, while there was no regeneration of the cerebellum. Here, then, was an instance,

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according to the current physiology, of the persistence of a function when the organ on which it depends is wanting. A more complete demonstration of the futility of the doctrine of motor properties of nerves or nerve-centres cannot be imagined, and it furnishes another to the already numerous examples recorded of the suicidal propensity of what is called experimental physiology.

But the difficulties attending the proof of the fifth being a nerve of sensation alone, do not end with the superior maxillary branch. The motions of the eyebrows, eyelids, and iris are still a problem to those who would refer them to the seventh and third respectively.

The continued power over the eyelids, after the seventh nerve was palsied, has attracted the attention of Bell in several instances, and he has made labored attempts to explain them. In a case reported by M. Descot, of Paris, in which the portio dura was destroyed for nearly an inch just after it came out of the stylo-mastoid foramen, and not a single branch could be traced back to the foramen, he has no other resource than to imagine that the patient must have preserved his power over the eyebrows and eyelids through some filaments that escaped the general destruction. In this dilemma Dr. O'Beirne, of Dublin, generously comes to his relief, and proposes to extend the temporo-auricular branch of the fifth to the eyelids, which, as it contains fibres from the smaller portion of the fifth, may possibly give rise to the motions. This will not account, however, for the dependence of the motions of the iris on the fifth pair, which Dr. Carpenter admits, and which, in order to explain, he would introduce motor fibres from the third, and, even in extreme distress, from the sympathetic. It is to be hoped that English, Scotch, and Irish ingenuity will not be exhausted in reconciling these facts, and in preserving the great discovery, the heirloom of the United Kingdom.

If we next turn our attention to the inferior maxillary branch, we shall find still more conclusive evidence that the fifth has to do with motion as well as sensation. We have already seen that Mayo admits a falling of the under lip on the division of the mental branch of this nerve. The continuation of the movements of the tongue in mastication has been noticed in some cases of palsy of the supposed motor linguæ. These movements admit of a quasi explanation not so far fetched as O'Beirne's interpretation of the motion of the eyelids above mentioned, as it is possible that some fibres from the small root of the fifth may mingle with the gusta

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tory branch of the fifth, though it is usually considered by anatomists to be wholly distributed to the muscles of the jaw.

But what has most attracted attention is the fact that in palsy of one-half of the body, while *usually* the tongue is protruded towards the palsied side, it *occasionally* happens that the person affected can direct it to either the right or the left as he chooses. Carpenter has attempted to explain this apparent contradiction, by supposing that a part of the fibres of the ninth come off from the medulla oblongata above the point of decussation of the pyramids, and a part below it. And that the different effects witnessed were owing to different parts of the brain affected by the disease which gave rise to the palsy. No sooner had he thus committed himself, than he was informed by Dr. Budd of an instance in which the hypoglossal nerve itself was completely divided on one side, and yet the tip of the tongue when the patient was desired to put it out was sometimes directed from, and sometimes towards, the palsied side. He now alters his conclusion, and observes that the muscles of either half are sufficient to give any required direction to the whole. Such is the shifting and evasion that favorite theories force on our standard authors.

When the hypoglossal nerve was divided and the motions usually referred to it continued, what was the alternative? There could be but one, viz., that the other nerves that went to the muscles of the tongue enabled the mind to perform the motions. These could be none other than the gustatory and inferior dental branches of the fifth.

We have seen that there are no less than three independent series of observations, one connected with each of the three great divisions of the fifth nerve, viz., its Ophthalmic, its Superior Maxillary, and its Inferior Maxillary; all going to show that the fifth nerve is employed in the production of motion as well as sensation. It may be possible that any one of these observations, taken singly, may have its natural bearing explained away, and made to appear exceptional by the ingenuity of the supporters of the theory. But when they are considered together, they present an amount of evidence well calculated to shake our confidence in what has hitherto been regarded as established truth.

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REPORT OF THE SECTION

ON

Meteorology, Medical Topography, and Epidemic Diseases.

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REPORT OF THE SECTION

ON

METEOROLOGY, MEDICAL TOPOGRAPHY, AND EPIDEMIC DISEASES.

THIS Section of the American Medical Association was organized by the election of Dr. JAMES WELSH, of Connecticut, Chairman, and Dr. ALFRED C. GARRATT, of Massachusetts, Secretary. It was ready for business soon after 3 o'clock P.M. of Tuesday, June 6, 1865.

The two following papers had been referred by the Association to this Section for consideration:—

A Report on the History and Treatment of Spotted Fever in Connecticut. By B. H. CATLIN, M.D., of Connecticut.

A Report on the Meteorology and Epidemics of California. By THOS. M. LOGAN, M.D., of California.

The first was presented and read in full by its author.

Dr. DEMING, of Connecticut, in commenting on the report, adduced some additional interesting facts and opinions.

Dr. N. S. DAVIS, of Illinois, briefly discussed the pathology of the disease, and alluded to the remedial value of such organic stimulants as turpentine, guaiac, and phosphorus, and such antiseptics as the permanganate and chlorate of potassa.

The discussion was continued by several other members, when, on motion, the paper was referred to the Committee of Publication.

The Section then adjourned.

WEDNESDAY, JUNE 7, 3 O'CLOCK P.M.

The Section was called to order by the Chairman, Dr. JAMES WELSH, of Connecticut.

The voluminous report of Dr. T. M. LOGAN, of California, concerning the meteorology and epidemics of that State, was taken up for consideration. It was found to contain one hundred and thirty-

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four pages of closely written manuscript, nearly forty of which were devoted to meteorology proper, and the remainder to the history of epidemic diseases.

After several portions of the report had been read, the whole was referred to a sub-committee consisting of Dr. N. S. DAVIS, of Illinois, with instructions to examine the same in detail, and report the result of such examination directly to the Permanent Secretary of the Association, in behalf of the Section.

The following resolutions were offered and unanimously adopted:

Resolved, That this Section respectfully request the American Medical Association to instruct the several Sections, in considering the papers and reports referred to them, to classify and dispose of them in accordance with the rules suggested by the President in his Annual Address to the present meeting.

Resolved, That the several members of the Standing Committee on Meteorology, Medical Topography, and Epidemic Diseases be requested to direct their attention to the procurement of reliable statistics concerning the temperature, moisture, electricity, ozone, etc., of the atmosphere in their several localities, in direct connection with daily written memoranda of the prevalence and particular character of diseases, with a view to their continuance through a series of years, and that they report progress to the Association annually.

The following members of the Association were appointed to fill vacancies in the Standing Committee on Meteorology, Medical Topography, and Epidemics, viz: Dr. ALFRED C. GARRATT, of Massachusetts; Dr. E. M. CHAPMAN, of New York; Dr. EZRA M. HUNT, of New Jersey; Dr. J. F. HIBBERD, of Indiana.

Dr. N. S. DAVIS, of Illinois, was also appointed a special committee to report on the etiological and pathological relations of epidemic erysipelas, spotted fever, diphtheria, and scarlatina.

The Section then adjourned.

ALFRED C. GARRATT, M.D., Secretary.

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REPORT

IN PART UPON

THE CLIMATOLOGY AND EPIDEMIC DISEASES OF CONNECTICUT.

BY

B. H. CATLIN, M. D.,
MERIDEN, CONN.

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REPORT IN PART UPON THE CLIMATOLOGY AND EPIDEMIC DISEASES OF CONNECTICUT.

My Report upon Climatology must be brief, owing to the want of time to obtain and arrange materials for a full elucidation of the subject.

In place of a general report upon the epidemics of Connecticut, I propose, at this time, to give a condensed, though somewhat extended, statement of the history and treatment of an epidemic, which has at different times prevailed to some extent in this State, under the names of typhus syncopalis, sinking, or spotted fever, with a brief notice of a peculiar epidemic of pneumonia typhoides.

Connecticut is one of the smaller States, being ninety miles in length east and west, by seventy north and south, lying between the 41st and 42d degree north latitude. The geological character of the rocks of the State are primary, secondary, and trap. The primary occupy much the greater part of the territory, and are divided into eastern and western by the large secondary, which extends from the Sound, at New Haven harbor, into Massachusetts. The secondary rock are of two formations, red sandstone, and shale. They resemble each other, though separated by the western primary. They are both traversed by dikes or ridges of trap. The eastern primary embraces all that portion of the State east of the large secondary, including New London and Windham counties, and parts of Middlesex and Tolland; the western primary rock embracing all that portion west of the large secondary, except the smaller secondary formations near its centre, including the counties of Litchfield and Fairfield, and part of New Haven County.

The eastern and western primaries may be regarded as extensive plateaus, terminating abruptly towards the large secondary, but sinking more gradually towards the Sound on the south. From an elevated position they appear like an extended level, with rolling and undulatory outlines, intersected by valleys and basins.[1]

[1] I am indebted to Dr. Percival's Report on Geology for the above facts, and some portions are in his own words.

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The largest valley is that of the Connecticut River, extending from Middletown into Massachusetts, the greater part of which is sufficiently elevated for cultivation, and the land is rich and productive. The most extensive valley in the eastern primary is that of the Quinebaug. There are limestone valleys near the western boundary of the State and along the Housatonic.

The greater part of the surface of the State is drained in a nearly equal proportion by the waters of the Connecticut, Housatonic, and Thames. Farmington and Naugatuck are smaller rivers on the west, the first emptying into the Connecticut, and the latter into the Housatonic. There are no extensive marshes near the rivers or lakes. The tide rises in the Connecticut as far as Hartford, forty-five miles from its mouth. The smaller rivers have considerable fall, and many are narrow and rapid, affording abundant water-power, which is generally improved.

The temperature of the State is very variable, from extreme cold to great heat, and the changes are often very sudden, the thermometer varying many degrees within a few hours. The winters in the northern part are often long and cold, the snow covering the ground for several months; other winters are mild and damp, with frequent changes. The temperature of the southern portion is very much modified by the Sound and the Atlantic Ocean, so that the winters are warmer, and the summers, in consequence of the sea breezes, cooler.

There is generally a great abundance of rain, though occasionally we have a dry, hot summer. The wind comes from every point of the compass, and often varies very suddenly from one point to another. Those from the west-northwest are dry, while those from the east, northeast, and southeast are damp, and are often accompanied with rain.

The great and sudden changes of temperature, and the humidity of the atmosphere are a frequent cause of disease, especially of the respiratory organs.

From this brief and imperfect history of the climatology of Connecticut, we might expect it to be a very healthy region, and such in general is the fact.

A distinguished author and practitioner of Connecticut, in an essay,[1] published in 1823, writes: "The exemption from widespread and mortal epidemic, during the period from the Revolu-

[1] Thomas Miner, M. D., Essays on Fever by Miner and Tully, pages 85, 86.

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tionary War to about 1805, was so great that many physicians passed the whole term of their practice, and scarcely met with a single, well-marked, original typhoid disease. It is confidently believed that the health of this section of the country exceeded that of the south of France.

"Typhus fever and pnuemonia typhoides, either as epidemic or endemic, were known to our ancestors, the latter under the name of malignant pleurisy, but for near half a century they did not prevail, except in some very limited districts. In the early settlement of the country, intermittent fever prevailed in the valleys near the rivers, but for the last century it has not been known among permanent residents, except in a few rare instances.

"The diatheses of the diseases were observed to change as early as 1806, but the great and decided change seemed to take place in 1807. In the latter part of the summer of that year an influenza, more universal than any within the memory of man, prevailed over all the Eastern and Middle States, and was of the most decidedly asthenic character. Not a person in five hundred escaped; nor was there one case in a hundred which was not attended with debility from the very access to the close of the disease. Lassitude and languor, with a moist skin and weak pulse, were its attendants in every stage. From that epidemic to the present day all our acute diseases have been asthenic, and progressively increasing in the severity and irregularity of their character. The exceptions are so few as not to be worth naming."

Different parts of the State of Connecticut have at various times been visited by very fatal epidemics; fortunately the regions over which they have prevailed have not at any one time been extensive. They have not been peculiar to regions similarly situated, but have appeared at the same time on the high hills and bleak, cool ridges of Litchfield County, and in the beautiful valley of the Connecticut River. They have manifested themselves in the cold, changing weather of our northern springs, after a succession of open winters and cold, damp summers, as well as during the hottest and driest summers known in this climate.

HISTORY.—In April, 1807, the most fatal epidemic ever known in Connecticut during the present century appeared in an elevated region of country near the centre of the first parish of Winchester, Litchfield County. This part of the town was inhabited by healthy, robust farmers and their families. Young people under twenty were most liable to it, and females more than males, though no age

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or sex was exempt. At first all the severe cases were fatal, death frequently taking place in ten or fifteen hours; some died before the arrival of the physician who was summoned to attend them. Such a sudden and fearful mortality occurring in a sparsely settled town, where every person was known to every other one, caused great alarm and panic, which soon extended to other towns. The character of the disease was not at first understood; of course the efforts made to arrest it were unavailing, while some were worse than useless. The physicians in that region had not been accustomed to meet with any acute disease that the lancet, calomel, and antimony would not cure almost without exception.

The same year, several cases of a disease similar in character occurred in Hartford, situated in the centre of the State, on the Connecticut River. The same disease prevailed in Medfield, Massachusetts, in 1806, where it was alike fatal. It received the name of spotted fever, from the petechiæ or spots which appeared in the skin in a portion of the cases. In September, 1807, the disease extended to the manufacturing village of Winsted, in the town of Winchester; in December, to the neighboring towns of Goshen, Torrington, and perhaps others, continuing through the winter and spring. The disease also increased during 1808 in Hartford and the adjoining towns, Windsor, Weathersfield, and East Hartford. It continued to prevail more or less in different towns in the State till 1815 or 1816; from that time till 1822 there were only sporadic cases. In the latter year, and during several succeeding years, a disease claimed to be of the same general character prevailed in Middletown, on Connecticut River, and at the same time in Berlin, Meriden, Durham, Chatham, Haddam, East Haddam, and other adjoining towns. Since 1829 our fevers have been typhus or typhoid, of a low grade of action, though not till recently accompanied with gastric sinking or petechiæ.

In 1862, two cases occurred in Hartford, which were reported in the *Transactions of the Connecticut Medical Society* of that year. These were rapidly fatal cases, with petechiæ and other symptoms resembling the early spotted fever. I have seen ten cases in Meriden, New Haven County (my present residence), since the first of January, 1863; two of these had petechiæ, two in the form of cerebro-spinal meningitis. Perhaps eight or ten more have occurred during the same period in the practice of other physicians in this place; two, under the care of an irregular practitioner, called small-pox, were, from information I obtained, probably of this character.

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I have recently received from my esteemed friend Isaac G. Porter, M. D., Vice-President of the Connecticut Medical Society, the history of several cases that occurred in the barracks at Fort Trumbull, near New London, Connecticut. They are interesting cases.

Most of the information that I have of the history and treatment of spotted fever, so called, previous to 1825, has been obtained from the following publications:—

In March, 1810, a dissertation on petechial or spotted fever, by Dr. Nathan Strong, Jr., was published in Hartford. The same year the Connecticut Medical Society published an article, written by Dr. Timothy Hall, of East Hartford, entitled "An Inquiry into the Propriety of using highly stimulating Remedies in the Petechial or Spotted Fever, and a Method of Cure proposed." In 1811, Dr. Elisha North, then of Goshen, Litchfield County, published a small volume with the following title: "A Treatise on a Malignant Epidemic commonly called Spotted Fever, interspersed with Remarks on the Nature of Fever in General," etc., with an Appendix, in which are letters from Drs. Elijah Lyman and Samuel Woodward, of Litchfield County, Dr. John Bestor, of Hartford County, and from several gentlemen in other States.

In July, 1825, Thomas Miner, M. D., of Middletown, published a pamphlet on "Typhus Syncopalis, Sinking Typhus, or the Spotted Fever of New England, as it appeared in the Epidemic of 1823." In August, 1825, the work was republished, with notes and an addenda containing miscellaneous remarks upon the disease as it appeared that year, with a history of cases.

The works named are all, I believe, that have been published on the subject in Connecticut, except a dissertation by Dr. Fish, of Hartford, which I have not been able to obtain.

I have also read a report by Drs. Thomas Welch, James Jackson, and John C. Warren, a committee appointed by the counsellors of the Massachusetts Medical Society, at their special meeting, March, 1810, on this disease; and have seen, I suppose, all or nearly all the publications in the medical journals and transactions of State societies respecting the prevalence of the disease in New York, Pennsylvania, and other States; but my report will be only in reference to its appearance in Connecticut, with incidental allusion to its history and treatment in other States.

In order to make my report as concise as possible, I shall give a condensed statement of the symptoms and treatment of the epidemic as related by the authors first named in connection, thus avoiding

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the tedious repetition which a separate notice of each article would require, reserving my remarks upon the epidemic of a later period for the remainder of the report.

SYMPTOMS.—A sore throat, so slight as not to be mentioned unless inquiry was made, was in some seasons regarded as a premonitory symptom. There was no unusual appearance of the throat. In other seasons or places, a rubbing of the nose and face caused, as the patients said, by a singular sensation of numbness which they could not describe. In some cases this continued for hours before the appearance of any other symptom. A prominent and early symptom in all severe cases was a great prostration of strength. Persons would sink or drop down suddenly, or be seized with delirium while they were engaged in their ordinary pursuits, or when in attendance upon the sick. In a great majority of the cases there was a general coldness of the skin; in some there were chills, occasionally a shivering and chattering of the teeth, but accompanied with so great torpor and insensibility, that the patient would have no sensation of cold. The extremities in the cold stage were purple or livid; there was violent and agonizing pain in the head, very frequently in the back part; great distress, and an indescribable sensation of sinking at the stomach; this was more or less present during nearly the whole course of the disease, but there were paroxysms of greater severity occurring at periods more or less regular. In severe cases there was a universal agony and distress of the whole system. Sometimes the pain would commence in the limbs, but soon extend to the head; at other times there was numbness or paralysis, occasionally affecting the organs of deglutition, so as to prevent the use of internal remedies. The severe pain in the head was generally accompanied with delirium, in sanguine young men; in the form of violent mania in nervous females of an hysteric character.[1] In some places, and in certain seasons, nearly all were delirious. There were frequently different degrees of stupor, from slight to deep coma, sometimes early in the disease, more commonly at the close of fatal cases. The tongue was occasionally nearly natural, generally, however, covered with a white fur, which in a few cases, as the disease advanced, became yellow or brown; in rare cases it was corrugated or very pale; the latter appearance was considered a fatal symptom. Often there were troublesome nausea and vomiting; these if accompanied with coma or delirium were unfavorable. The bowels were more commonly costive; in some

[1] Some were supposed to be only cases of hysteria till near the time of death.

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cases, especially children, there was diarrhœa; the thirst was less, and the appetite better than in typhus. When thirst occurred, it was relieved more by aromatic drinks or stimulants than by water. The urine was nearly natural, except in some cases where there was an hysteric flow. The eyes were red and watery or dull and heavy, the pupils either dilated or contracted, sometimes very brilliant, which was only the precursor of the glassy state which followed. The sight was often impaired; sometimes there was complete temporary blindness. The pulse was in all varieties of cases soft, weak, never hard; in some cases frequent, in others as slow or slower than in health; often irregular, fluttering, or entirely absent for an hour or more, even in some cases that finally recovered. Hemorrhages were not common, but when they occurred, the patients sunk under them. Cases occurred where life appeared to be lost in consequence of the catamenia supervening upon the disease. The petechiæ, or spots from which the name of the disease was derived, were more common the first than subsequent years, and were evidently a flowing of blood from the skin under the cuticle. They varied in size from a pin's head to a six cent piece, varying in color from a pale red to a dark purple or livid, the darker the more dangerous the disease; appearing first on the face and neck, less frequently on the limbs and whole body; sometimes seen early in the disease, more frequently near the close of fatal cases. Respiration in some cases nearly natural, in others frequent and laborious. In many of the fatal cases the breathing through a principal part of the disease was completely stertorous.

Some of the more unusual symptoms were blindness, double or triple vision, drawing back of the head by a clonic spasm of the muscles of the neck.[1] Erysipelatous affection of the skin, inflammation of the joints, like acute rheumatism, or severe pain without any external morbid appearance; the pain sometimes in one toe or finger, at others in the bowels like colic; a corpse-like rigidity of the limbs, hemorrhages. Instead of the usual cool or cold skin, there would be heat of a thrilling, stinging character; aphthæ in the throat, torpor of the urinary bladder, requiring the use of the catheter.

TREATMENT.—From previous remarks concerning the education and practice of the physicians of Connecticut fifty or sixty years ago, it would be natural to infer, that in such a violent epidemic, they would resort to such means as they were accustomed to use

[1] Symptoms of the disease termed Cerebro-Spinal Meningitis.

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for removing disease. One[1] who was acquainted with the early cases, writes: "Having no guide but experiment, bleeding, vomiting, purging, sweating, and stimulants were all tried." These will be noticed in the order mentioned.

BLEEDING.—Dr. Woodward says: "In some instances in this season (1807), the disease undoubtedly put on the inflammatory type, in which blood-letting proved a remedy; but subsequent experience has convinced me that it was used much too often . . . . I saw cases where there was insupportable anxiety and tossing of the head, accompanied with great heat, where ease was procured by small openings in the veins of the hands or feet, and the blood suffered to flow by drops. I likewise saw several who were brought into a low comatose state by a small bleeding, which cases entirely baffled the power of medicine, and proved fatal." Referring to the disease in the village of Winstead, in the autumn of 1807, he writes: "Bleeding was tried, but I believe always did harm."[2] Again: "I have not bled a patient for a twelvemonth, when laboring under that disease;" though he adds, "I *have seen some* very malignant cases, but generally the disease, the year past, has been much milder than before."

Dr. Bestor, of Simbury, Hartford County, writes: "I took small bleedings from the first two patients which I saw, the bad effects of which, though not fatal, taught me afterwards extreme caution in the use of the lancet or in making any other evacuation in the beginning of the disorder." "I bled in the summer of 1808 five only; their pulses were stronger than common, and the quantity of blood taken was small; I was not able to perceive that it did good or harm. In one case it eased the pain of the head for a little time. The blood never showed any signs of inflammation. In one instance it remained perfectly fluid."[3] Dr. Strong, of Hartford, writes: "Others had recourse to the lancet, for though the pulse was found feeble and depressed, it was supposed that this depression might proceed from congestion and over-distension of the vessels; that upon a part of their contents being let out reaction might ensue. Some, upon finding that the desired effect did not take place, that the pulse, instead of rising, sank still lower after a moderate bleeding, laid aside the lancet. Others, supposing that

[1] North on Spotted Fever, pp. 115, 118.

[2] Dr. Samuel Woodward, of Torringford, about five miles from Winchester, where the disease first appeared.

[3] North on Spotted Fever, p. 167.

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although one bleeding appeared to be injurious, yet, as it is stated to be sometimes in the plague and yellow fever, a repetition of it might produce a different effect, continued to use them, and some even carried it so far that several patients died under the operation."[1]

Dr. Timothy Hall, of East Hartford, writing in 1810, gives the history of two cases that he bled, he thought, with advantage; they recovered. To one he gave wine and tonics, to the other, who was about in three days, he does not say what he gave.

Emetics and Cathartics.—Dr. Woodward writes: "When there is vomiting accompanying a sufficiency of vital strength I give vomits, but seeing the ill effects in a few cases, I am cautious and hereby caution others against vomiting where there is lowness. I endeavor to obviate costiveness with some kind of cathartic; calomel is a favorite ingredient for that purpose." Dr. North says: "As to the means which experience has found useful in the first cold or sinking stage of the fever, when it appears in its worst form, it is proper to observe in the first place that all evacuants, such as venesection, emetics, and cathartics, are hurtful. Great injury and even death in some instances have been consequent upon the injudicious use of such remedies." Dr. Bestor, writing of one variety of the disease in which there was pain in the bowels, says: "I saw one patient in this situation where a young physician had given a large dose of calomel and jalap, the effect of which was as might have been predicted. He died in about twenty-four hours from the attack."

All these physicians used evacuants more or less in the course of the disease, especially in cases that were mild or complicated with derangement of the stomach and bowels. Some made an effort to move the bowels in a few hours after the attack, others not before the third, fourth, or sixth day. Some used calomel in moderate doses; more frequently milder cathartics were used and their operation assisted by enemata. Experience taught them that the means to be relied upon in the treatment of this fearful disease were external heat, stimulants, tonics, and counter-irritants.

Sweating and Steaming.—Dr. Woodward, seeing the impotence of the means adopted for the cure of the first cases in Winchester, determined to try steaming. His theory was that the capillaries ceased to perform their function and stopped the circulation. He

[1] Dissertation, pp. 27, 28.

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had an extempore tube made by nailing three narrow strips of board together to convey the steam from a kettle to the bed. This he left with a Mrs. Hurlbut, of W., to be used immediately in the first case that should occur. Mrs. H. suggested that the boughs of the common hemlock be put into the water of which the steam was to be made. There was no objection to this. Soon a case occurred in Mrs. H.'s own family (one or two of the family having previously died); the steam was used and the patient was saved,[1] it being the first recovery in W. at least from any severe attack of the disease. It at once became a popular remedy, though heat was more generally applied by means of blocks of wood taken from hot water, hot brands from the fire quenched in water, and various other means. At the same time a decoction of the twigs of the hemlock was given internally. Subsequent experience taught the physician that there was no particular virtue in the hemlock, but that the steam or heat was the only essential part of the remedy.

Stimulants and Tonics.—"When patients were raised from a low comatose state, it was done by large quantities of stimulants and tonics. When wine or ardent spirits were given in such quantities as to produce a degree of intoxication, they never appeared to do any injury. Laudanum, brandy, wine, essence of peppermint, hot sling, hot tea of pennyroyal, peppermint, with spirits, were used."[2] Dr. North commenced early with stimulants and tonics, and was very successful, though the disease must have been much milder than in the previous year.[3] All the physicians of that day used stimulants, though Dr. Hall objects to a *highly* stimulatory course. Dr. Strong, writing of the indications of cure, says, the object is "to support the vital energy, to raise the patient from this depressed state, and to hold him up till the disease passes off." The best mode of answering this intention is "by a proper use of a nutritious diet and of tonic, cordials, and stimulating medicine." I have seen a few glasses of tea made from the mentha pulegium, or light wine whey, accompanied by a few drops of laudanum, remove the disease. I have seen a delicate female take more than a quart of French brandy in the course of eight hours, accompanied by a grain and a half of opium every two hours. At eleven

[1] Dr. North gives Mrs. Hurlbut the credit of suggesting the steaming, but the above account is the correct one.

[2] Dr. Woodward.

[3] Of 100 cases, nearly all recovered. The first three cases in Goshen were fatal and buried in one grave. Dr. North did not see them.

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o'clock A. M., when this course commenced, she lay in a comatose state, cold and senseless, her skin dry, and the action in the radial arteries so feeble that it was difficult to say whether the pulse beat or not. A constant hiccup was supposed by every one to be the harbinger of death. Wine and all the milder stimulants were rejected from her stomach as soon as they were taken; each turn of puking seemed to bring her still nearer to the grave. Brandy saturated with loaf sugar was now resorted to. It stayed upon the stomach, removed the hiccup, brought back the vital heat, unlocked the senses, and increased the energy of the pulse. At sunset, after having taken the enormous quantity of brandy and opium above mentioned, she exhibited no signs of intoxication, was calm and rational, had a good pulse, a soft, moist skin. To keep her in this state, however, a very liberal use of brandy and opium was found necessary for a number of days. And should we mention the quantity she actually took, our account would hardly gain credit. It is more than eighteen months since her illness; she enjoys good health, and her constitution has been better since her sickness than it was before. This is mentioned *not* as a specimen of general practice, but as an extreme case, and one that required extreme practice.[1] Dr. Lyman has given in seven hours, viz., from 5 o'clock A. M. to 1 o'clock P. M., to one patient the following quantity of stimulants, viz., tinct. opii, gtt. 100; tinct. cort. comp., f℥j; essence of mentha pip., f℥v; gum camphor, ℥ss; brandy, f℥ij; wine, one pint and a half. Besides these, external stimulants, such as tinct. of camphor and spt. of ammon., were applied to the nose and temples. External heat was assiduously used during the same period. At 12 o'clock at noon I saw this patient as consulting physician, and found him relieved from a most deplorable state of torpor, and was satisfied that stimulants had not been used too liberally.[2]

Notwithstanding this bold, energetic, and, under the circumstances, very appropriate practice, we find all these old physicians disposed to use as small an amount of stimulants as would answer the indication of each case. They preferred wine to brandy, and hot aromatic infusion to either, provided they were sufficient to support the patient. Opium in pills or tincture was used more frequently in Hartford than in Litchfield County. It was considered an important medicine, given generally in moderate and oft-

[1] Dr. Strong's Dissertation, pp. 28, 29.

[2] Dr. North on Spotted Fever, p. 80.

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repeated doses. Cinchona in powder mixed with wine, or in the form of Huxham's tincture, and other bitter tinctures or infusions, were extensively employed. Fowler's mineral solution was used in Hartford and vicinity, it was thought with advantage.

Blisters.—Blisters were used very freely, especially in cases where the brain was the seat of the disease. They were applied to the back of the neck, the forehead, or the whole head was shaved and blistered, and also to the stomach or extremities. They seldom were a source of suffering to the patient, and in the worst cases the most powerful epispastics would have no effect.

I have endeavored to give a correct synopsis of the history, symptoms, and treatment of this disease. As far as it is true to the original, it can be depended upon. Dr. Strong was a young man, the others I knew to be physicians of high reputation and distinction among their brethren and in the community where they resided. With Dr. Woodward[1] I was personally acquainted. He was a man of commanding person, had a strong mind, and sterling common sense. When I was a youth he was an eminent counsellor for all the neighboring physicians.

Pneumonia Typhoides.

In this place I will notice another disease which prevailed in some towns in Connecticut in 1812 or '13, the history of which has never been written, and, for the want of materials, never can be fully. Living only a few miles from where the disease prevailed, in the Parish of Torringford, Litchfield County, I recollect distinctly (though only a young lad at the time) some of the circumstances attending the disease, and the names of some who died, but I am indebted to my friend Dr. Charles Woodward, the youngest son of Dr. Samuel Woodward, for the facts which I shall relate. He was an eye-witness to some, and while studying medicine with his father these epidemics were matters of frequent discussion. Dr. Woodward considered the disease to be pneumonia typhoides of a peculiar character; he always remarked to his son that there was no inflammation, but the lungs became congested at once, decarbonation of the blood did not take place, the respiration would be difficult, and pulse cease, while the muscular strength and appetite were little, if at all impaired.

[1] Father of Samuel B., Henry, and Charles, who were all at one time engaged in extensive practice in three different towns on the Connecticut River.

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A married man died after a short illness, his wife at the time, and through the day, was not well, but it was attributed to fatigue. While they were carrying out her husband for burial she was suddenly attacked; the corpse was carried back; she died in the evening, and the next day they were both buried in one grave.

As Dr. Woodward was overworked, his son Charles often took him in a carriage to visit his patients. They called to see a patient perhaps on the second day of his disease. The patient met the doctor at the gate and remarked, "Doctor, you are too late, I am dying!" Dr. Woodward soon came to the same conclusion. His face was a deep livid color; he went into the house with the doctor, and said, "Doctor, I am almost starved." Dr. Woodward replied, "Eat as much as you choose." He eat heartily of cold pork and potatoes, dictated his will, lay down on the bed, and died before the doctor and his son left the house.

A disease so fatal in a country town, of course, caused great alarm, and, though the physicians did not consider it contagious, the people did, and, as a consequence, the sick were so much neglected that a town meeting was called, and it was voted that nurses and watchers be hired for the sick at the expense of the town; coffins made air-tight were prepared beforehand; till then, an unheard-of thing in a country town.

The late Dr. Hough, of Meriden, often related to me several cases of the same disease that occurred in his practice, probably about the same time, giving the names of the deceased. He said they would have a good appetite, a regular movement of the bowels, be able to walk about, or sit up till death took place. I regret that I did not obtain from him more facts respecting the disease, the remedies used, and whether there were any recoveries. Dr. Hough remarked that there was very little cough, but the patient would spit up matter that appeared like disorganized lung. I have no further information respecting this disease.

DR. MINER'S PAMPHLET.—Having completed my report upon the so-called spotted fever of the early part of the century, I will proceed to notice the disease described by Dr. Miner in the pamphlet to which I have referred, and as it appeared under my own observation.

I have no personal knowledge of the disease described by Dr. Miner as prevailing in 1823, having commenced my professional life in Haddam, situated on the west bank of the Connecticut River, ten miles below Middletown, July 13th, 1825, the month Dr.

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Miner's pamphlet was published, a copy of which was presented me by the author.

Under date of August 29th, 1825, Dr. Miner writes in the Addenda: "Typhus syncopalis has continued to be the prevailing disease, and there have not been more than one or two weeks at a time since March, 1823, in which it has not been noticed." During the summer and autumn of 1825, there was an unusual prevalence of fever in all the neighboring towns.

Many physicians in Connecticut, and some in Middletown and vicinity, doubted whether any such fever as that described by Dr. Miner prevailed in that vicinity, except what was caused by his peculiar treatment.

The publication of the pamphlet produced a great excitement in Middletown. The authorities of the city requested all the physicians to give written opinions respecting the disease then prevalent in the city. The majority of them certified that they saw no disease that answered the description given in the pamphlet in their own practice, but, on the contrary, the cases they met with were such as required a different treatment. These certificates were published in the newspapers of the city.

There was much party feeling in the place at that time, and an unwillingness to have the reputation of the city suffer from undue alarm in reference to the prevalence of disease.

From subsequent experience, some of which will appear in my report, I was satisfied that there was a low fever prevailing in that region with symptoms different from the common typhus or typhoid fever, which also was common at the same time.

The similarity between this low fever and the spotted fever were the sudden attack, the cold or cool skin, the subsidentia or sense of sinking at the stomach, pains in the head, delirium, numbness, and partial paralysis. It differed from the early disease in the almost entire absence of petechiæ, they being present in only two cases of the three hundred and sixty (including the mild cases) in 1823, related by Dr. Miner, though it was said they were more common in 1825. The disease was more protracted, resembling low typhus. The pulse and respiration were more commonly slow. The attack, generally, was not as sudden, the first appearance of the disease being more insidious.

Symptoms.—The symptoms of this low disease, as they occurred under my own observation when under the influence of only moderate quantities of opium, or where none was used, were an

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unusual prostration of muscular strength, inability to maintain an erect or sitting posture without faintness or sinking pain in the head, often severe, accompanied in many cases with delirium; pulse always feeble, soft, sometimes full, never hard or strong, often intermitting and variable, sometimes in the course of one hour varying from thirty-four to one hundred and over; skin cool, many times quite cold; occasionally slight chills, seldom severe. The distressing sense of sinking and faintness at the stomach was a frequent symptom, sometimes accompanied with paleness, more generally with a look of anguish. Tongue covered usually with a white fur. Some were torpid, others irritable. Deep coma occurred in a few cases; in one of those treated without opium, coma was a prominent symptom for four days, from the third to the sixth inclusive; this was preceded and accompanied with nausea and vomiting, great liability to an increase of prostration and sinking after evacuations. I do not recollect of seeing any petechiæ or drawing back of the head like cerebro-spinal meningitis[1] during my practice of nearly seventeen years in Middlesex County. The *first attack* of some cases resembled the effect of large doses of active narcotics. In one which I have noted, the resemblance was so perfect that the neighbors who did not have a good opinion of my patient supposed she had taken poison for *self-destruction*. There was no evidence in support of the suspicion. She recovered.

Ischuria was most common where opium was freely used, though in the case referred to, where none was given, there was no evacuation for thirty-six hours, when it passed off freely under the influence of cantharides used both internally and externally. There were some rare insidious cases where the patient was able to walk about the house till a critical sinking, when death soon ensued.

DIAGNOSIS.—A careful examination of the symptoms of sinking or spotted fever will generally enable one readily to distinguish it from any other disease. Some of the sudden severe attacks resemble very nearly malignant scarlet fever, but the prevalence of one or the other of the diseases at the time will generally lead one to decide correctly. Practically it would not be very important, for the treatment required for both would be similar. The insidious protracted cases might be mistaken for typhus or typhoid fever, but the appearance of the tongue and the deranged secretion of the

[1] Dr. Miner mentions no cases of drawing back of the head.

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stomach and bowels of the latter would generally make the decision easy.

There is danger of mistaking those cases where the pulse and skin are so natural as to induce one to suppose there is nothing serious till a fatal disease of the brain manifests itself just before death.

PROGNOSIS.—This should always be considered a dangerous disease in all its forms. When it prevails as an epidemic the first cases are generally the most severe and fatal, often beyond the reach of medicine before the physician is called; the same is also true of many of the sporadic cases.

The insidious cases where a severe brain affection comes on at the end of a week or ten days of apparently slight illness, are almost always fatal. Our prognosis should always be guarded, though we often see a large proportion of the subjects recover. The sudden attacks, if the physician succeeds in producing even a moderate reaction, result most favorably.

CAUSES.—At the time the spotted fever prevailed in Litchfield County, 1807, 1808, and 1809, it was supposed that the cold, damp summer, and the bad rye (containing ergot) upon which the inhabitants depended for their bread, were remote or predisposing causes, but the use of poor rye was not in so general use in Hartford County, and neither of these causes was present when a similar disease prevailed in Middletown and vicinity in 1823 and succeeding years. The subjects of this disease in Connecticut have been almost without exception native born, well fed and clothed, with comfortable residences.[1] Very few physicians have considered the disease contagious. There is no malaria in the State to cause such a disease. All that we know is that the cause is atmospheric. There is an epidemic influence or diathesis that predisposes persons living within its influence to an attack of the disease; as to what this is, no satisfactory explanation has ever been given. We see the effects, and hope that science may at some future time discover and explain the cause.

The exciting causes are exposure to the changes of the weather, grief, fear, or any of the depressing passions, excessive fatigue, especially when attending upon the sick, nursing, watching, or anything that produces debility.

PATHOLOGY.—At the time of the early prevalence of this epi-

[1] This refers to cases occurring previous to 1830, there being few foreigners in the State at that time.

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demic, pathology as a distinct branch of medical science was hardly known. Dissections have been rarely made in Connecticut. I believe Dr. Miner was correct in defining it a nervous fever. The appearance of those cases attended with petechiæ would lead one to suppose it was a blood disease; but in these cases are not the nerve centres first diseased, and the blood secondarily, though they appear simultaneously? The elucidation of this I shall leave to others.

NAME OF THE DISEASE.—No satisfactory name has ever been given to this disease. Spotted fever is certainly very objectionable, the spots occurring only in a small proportion of the cases. Typhus syncopalis is less inappropriate, though many cases are not characterized by faintness or sinking. For a common or popular name, I prefer sinking typhus.

TREATMENT.—I will first give a brief account of the treatment found to be most successful in Middlesex County, in 1825, and subsequent years, and then criticize somewhat closely Dr. Miner's directions for treatment.

The most important remedies, as we ascertained from experience, were the acrid stimulants, cantharides, capsicum, spirits of turpentine, phosphorus; some of the essential oils with wine and brandy, quinine, cinchona bitters, and aromatics; opium or morphine sufficient to allay irritation. Some of these articles with external heat were prescribed at the first call in the severe cases. Moist heat, by means of hot stones or bricks, cooled by dipping in water, then wrapped in cloths, or jugs of hot water, was preferred to dry heat. In the milder cases calomel was often administered in doses of three or four grains, and repeated every third or fourth hour, followed by mild laxatives or enema till a movement of the bowels was secured. It is doubtful whether any benefit was secured by the use of the calomel, except in the very few cases where there was derangement of the stomach and liver. Fowler's liq. potassa tartras was very little used in my own practice, or by those with whom I was associated. Forty years ago quinine was not used extensively, and its properties not as well understood as they are at this time. Spirits of turpentine was seldom given by the mouth, but very frequently and freely by enema. In many of the cases cathartics, even mild laxatives, or a simple enema of molasses and water, would produce dangerous sinking. For this reason no effort was made for days, and in the case of some practitioners for weeks, to move the bowels; but trouble would appear after a few days from this practice, not in the abdomen, but in the head or stomach. We

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soon found we could move the bowels whenever the necessity of a movement was indicated, by enemata of turpentine. Doses varying from one to three tablespoonfuls, mixed with one or two eggs and half a pint of warm water. The largest dose never was employed, except in cases where large quantities of opium had been given. These enemata were perfectly safe; in the lowest cases they never caused sinking, but stimulated and aroused torpid cases.[1]

It seemed very evident that phosphorus was the efficient means of saving life in some very low cases, given in the form of an ethereal solution. In one of the very lowest cases I ever saw raised, it was frequently administered with quinine by enema, the patient refusing for weeks to swallow medicine. It was, however, somewhat difficult to manage its use, the luminous appearance in the night occasionally alarming the nurses, unless previously explained.

Dr. Miner's description of the disease he named Typhus Syncopalis is, in the main, very correct, and his caution respecting the danger of depleting and evacuating agents eminently worthy of our regard; but lest his work may be used as authority for the treatment of this disease in the future, it is important that this part of his pamphlet be closely scrutinized.[2] He writes, page 16:—

"Opium was the most important remedy in the severe form of this disease, and was in such cases *regularly* administered from the very first visit. A few cases imperiously required half an ounce of the tincture in an hour, or half a drachm in substance in the course of twelve hours before the urgent symptoms could be controlled; and even some cases required a drachm in the same time. All these patients recovered. In nearly every fatal case of this year, there were circumstances to prevent a free use of medicine. *The whole of those patients, whose symptoms were promptly met with opium, recovered.*"

"Opium *enough*, assisted by external applications, would command every peculiar symptom with as much certainty as any effect can be promised from medicine, except the extreme sinking after a

[1] Dr. Asa M. Holt, of East Haddam, was the first to use the large doses of turpentine for enemata, and he suggested many other improvements in the treatment of this disease.

[2] The most kindly regards for the memory of Dr. M. are ever cherished by me. He was very kind to young men, and often gave me advice which was highly prized and is practised upon to this day. His Essays on Fever, in a work entitled "Miner and Tully on Fever," though severely criticized when first published, are very valuable, and should be read by every young physician of this day.

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critical effort in a neglected or ill-managed case; and even in this forlorn state it always mitigated much of the anxiety and distress, and prolonged life." These are very unguarded expressions, and were the cause of a great amount of bad practice. It was no doubt true that those who took the largest doses of opium recovered. The late Dr. Hough, of Meriden, informed me that a patient under the care of himself and partner took a tablespoonful of laudanum, the nurse mistaking the directions, which were a teaspoonful. The dose was repeated once an hour several times before the doctor arrived. The patient recovered.

Dr. Miner gives a very favorable result of the cases that occurred in 1823, including one hundred and eighty mild cases, where the patients were not entirely confined to their beds for any considerable time. He writes: "Out of these cases, being in the whole about three hundred and sixty, twelve died, viz., six adults and six children."

I do not doubt the accuracy of his statement, as my own experience in the disease, and of his manner of treatment commenced, as I have remarked, in July, 1825, but I shall be able to detail several factitious cases where the peculiar symptoms resembling sinking typhus were the effect of excessive doses of opium.

Preceding my medical education on my native hills, in Litchfield County, Connecticut, Berkshire County, Massachusetts, and at the Medical Institution of Yale College, New Haven, I was fully indoctrinated in antiphlogistic practice. This made me suspicious of the propriety of the stimulating practice, and doubtful whether there was any such low disease prevailing in that region as had been described, but a distrust of my own abilities led me to observe with care.

The first case of fever I was called upon to treat occurred July 23d, 1825. There had been a slight chill followed by a moderate fever. There being some derangement of the stomach, I gave an emetic of ipecac., to be followed by a cathartic of calomel; comp. ipecac. powder to be administered after the operation of the cathartic. The medicine operated favorably, and the patient was comfortable for thirty-six hours, then, without any apparent cause, she became faint, and had a sensation of sinking at the stomach. For this I prescribed small doses of tincture of opium, essence of peppermint with infusion of serpentaria Virginiana, spts. ammonia, tinct. lavand. comp., with the addition in the course of a few days of infusion cinchona. She continued to have occasional turns of sinking, and

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was low and feeble for several weeks, but finally recovered and is still living. The next cases that occurred in my practice were common typhus. Reducing medicines were generally avoided, though in most instances a cathartic of calomel was given at the commencement of the disease.

On the 15th of November, 1825, I was called to Mrs. S., aged about 30 years. I found her sitting up in bed; she said her distress was so great that she could not lie down. She groaned loudly and continuously; her pulse was somewhat accelerated; tongue coated. I gave her ether and laudanum, alternating with grain pills of opium, repeating the doses frequently. I was with her most of the day, but she obtained no relief.

Late in the afternoon a physician from an adjoining town was passing, and at my request was called in. He at once decided that it was a bad case of typhus syncopalis, and recommended a large increase of the opium. As I had been unsuccessful in my efforts to relieve my patient, I was willing to follow his advice. A pill of opium, containing two and a half grains, was given once an hour, through the night. We both spent the night in the house, and in the morning found her quite comfortable, so much so that we were satisfied that the treatment was judicious. The same course was continued with an occasional extra pill of opium, as the distress or sinking returned. She also took brandy and infusion of bark freely. For three days she took from seventy-five to eighty grains of opium a day. My counsellor was associated with me rather as attending than consulting physician. On the fourth day she sunk into a profound coma, from which she was aroused by the application of blisters and spirits of turpentine, covered so as to prevent evaporation. The quantity of opium was diminished, but the sixth day of the disease she again became comatose, and was supposed to be dying, but after an hour or two she recovered. From this time the opium was given in much smaller doses. The bowels moved by enema. She improved slowly, and recovered so far as to dispense with my attendance at the end of eight weeks. The patient was seen by Dr. Miner and other physicians, and it was regarded by them as a remarkable case of typhus syncopalis. At the time this patient was sick, I had several other cases of low fever. They were treated with opium, brandy, bark, epispastics, and other stimulants. Most of them recovered, but their recovery was slow and imperfect. This led me to study the nature of the prevailing disease, and the propriety of the medicine used, and I

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was satisfied that a different course of treatment would be better adapted to the disease.

On the 27th of February, 1826, I was again called to visit Mrs. S., the patient who took the large doses of opium. I found her suffering from the same train of symptoms she had at my first visit, Nov. 15th, and they were equally severe. I gave her a large dose, probably fifteen grains of calomel, with a grain and a half of opium. She was relieved in the course of a few hours; the calomel passed off in about twelve hours, followed in two or three days by a slight ptyalism. Her recovery was rapid and much more perfect than before, requiring attendance only five days. She is still living. This was a factitious case of sinking typhus, though it was pronounced, as I have before observed, a true and marked case, by the most experienced physicians of the country.

A careful examination of this case shows that it had none of the characteristics of spotted fever, except those caused by the excessive use of opium. There was no coldness of the surface; no great prostration of strength, the patient preferring the sitting to the reclining position; indeed she could not lie down without increase of suffering; no pain in the head, no delirium, no sinking at the stomach, or coma, except what followed the use of opium. On a review of the case, it is perfectly evident that it was originally a disease of the stomach with biliary obstruction. The success of the treatment adopted in a subsequent attack corroborates this opinion.[1] In connection with this, other false cases of the disease, or bad treatment of true cases, will be introduced. During the prevalence of the disease in Middletown, in 1825, a classmate of Dr. Cone's being in town, he was invited by the doctor to see one of his patients. He says: "I found a woman aged about thirty, in a comatose state; it was with great difficulty anything could be got down her; the coma was the only marked symptom. The doctor was giving a mixture from a teacup, which, upon inquiry, I found was composed of one part laudanum and two parts essence of cinnamon; a teaspoonful was given every two hours. The doctor asserted that the coma was characteristic of the disease, and that the opium would bring her out of it, and nothing else would, and the next morning she would come out all bright; but she never saw

[1] During the first attack of the above patient, a case of low fever, complicated with diarrhœa following parturition, occurred in my neighborhood, where eighty grains of opium a day were given (as I was informed by one of the attending physicians), and yet she died. Was it because she did not take *opium enough?*

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the light of the morning—she died in the night." A distinguished jurist of Middletown lost two sons by the prevailing epidemic. With one I was acquainted; he died in 1826. Soon after, a daughter was taken sick in a similar manner, and had the same treatment, large quantities of opium and stimulants. A distinguished professor was called in counsel, and advised a large increase of opium. In the night of the fourth day of the disease, the daughter requested her father to be called up. She told him she was going the same way her brothers had. She had her reason then; she wished him to promise to dismiss her physician and send for Dr. Henry Woodward, then practising in Middletown. Dr. W. was called; he omitted the opium, gave her stimulants and tonics, and she recovered. I had these facts from Dr. W. soon after they occurred.

Only one more case of this character will be mentioned. The 21st of March, 1829, I was summoned to take charge of a young lady of 15 or 16, in an adjoining town, her physician having been obliged to leave his business on account of ill health. I learned from the mother of the patient that she had had sinking turns every day, which were increasing in frequency and severity. I found she was taking a large pill of opium, between two and three grains, every four hours; a large dose of laudanum, nearly a teaspoonful, every four hours; infusion cort. cinchona, brandy, and pepper tea, all the stomach would bear. I was at once satisfied that a change in the treatment was of the utmost importance; but being called at the request of the attending physician, and choosing to avoid any display, I directed pills of the same size, composed largely of camphor, with one-fourth of the opium she had been taking; filled up the laudanum vial with saturated tincture of cantharides, continuing the bark and brandy, moving the bowels by a stimulating enema. She never had another sinking turn, and recovered rapidly, so that I dismissed her cured in ten or eleven days. I regret to say that this patient died a few months after, under the attendance of the physician who had the care of her in the first part of her previous illness.

This physician continued to have cases of a like character till he was confined by a fatal disease. The practice of the place then came into my own hands and those of a young physician, for whom I was counsellor; and from that time there were no more sinking cases.

The above are given as specimen cases. A friend of mine was often called in counsel to similar cases, where by greatly diminish-

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ing the opium, or entirely omitting it, moving the bowels by stimulating injections, a sudden improvement and final recovery were secured. I remember many of those which he related to me at the time of their occurrence. I have proof that all were not manufactured cases, for three patients were carried through their sickness without opium; two under my own care, and one in the practice of another physician. The disease was in a severe form, attended with coma, nausea, vomiting, and gastric sinking; but not with much pain. They all recovered, though two of the cases were protracted. There is less danger from one or even several large doses of opium, than from smaller quantities continued a long time. The reason is very obvious; for either the stomach rejects it, or effects follow that can be ascribed to no other cause; while smaller doses (though larger than the case require) produce a train of symptoms so nearly resembling sinking typhus, that men of large experience are sometimes deceived. Dr. Miner writes, page eleventh: "Except where there are convulsions, or in a very few instances, where something like maniacal exertion appears, or when the fever counterfeits delirium-tremens, the affection of the brain in this disease (unlike many head-affections in pneumonia typhoides and common typhus) rarely produces any increased muscular strength; but, on the contrary, it usually occasions great languor and inability for muscular exertion, which is more especially manifested when the patient is in an erect posture. As has been before observed, this debility was a kind of paralysis, and appeared to arise from a partial extinction of the vital principle, more resembling the effect of excessive doses of the active and pure narcotics, or of a sudden and violent concussion of the brain, than the exhaustion of the latter stages of common fever. The exhaustion or deficiency of *vital energy* in both cases appears to be the same, and the same proportion of the living principle is extinguished; only, at the end of protracted fevers, there is a great waste of the solids and fluids of the body, which must be repaired before much muscular strength is acquired."

This is a correct description of a certain form of this disease, but upon what principle, unless it be that of *similia similibus curantur*, does he recommend opium for those symptoms which resemble the effect of excessive doses of the active and pure narcotics? In a sentence which I quoted above, he says: "Opium *enough*, assisted by external application, would command every peculiar symptom with as much certainty as any effect can be

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promised from medicine, except," not coma and those symptoms which resemble excessive doses of the active and pure narcotics, but "the extreme sinking." In a note, p. 25, he mentions: "The fact that coma and other typhoid affections of the brain are more surely relieved by opium than any other remedy." It cannot be denied that patients have come out of a comatose state occurring at or near the commencement of the disease, under the use of opium in moderate quantities in connection with other remedies, and there are cases accompanied with nausea and vomiting where it might be so used with advantage, but the natural inference is that the appropriate remedies for those symptoms which resemble the effect of excessive doses of the pure and active narcotics, would be cantharides, blisters, and injections of turpentine, which are known to counteract the effects of such excessive doses. Experience proves that these, with other stimulants and acrids, are the medicines to be depended upon for the treatment of all torpid cases.

There is another class of cases, the painful and irritable, that require the use of opium or morphine, and in some of these large doses are required for a temporary purpose. Those cases resembling cerebro-spinal meningitis, all those where there is severe pain, agony, distress, or nausea and vomiting arising from sympathy of the stomach with the brain, demand a liberal use of opium. It is only the indiscriminate and excessive use that is condemned.

Emetics and Cathartics.—The old routine practice of administering emetics or cathartics in the commencement of fevers, either sinking or typhus, merely because they are fevers, with the idea of preparing the system for the operation of medicine to be subsequently employed, should be forever discountenanced and discarded. It has already done infinite mischief. The popular saying "that doctors make worse before they make better," should never be true of those who practise in these diseases.

In a majority of the cases, there is no derangement of the stomach or bowels, that emetics or cathartics would correct, and in many of the sudden and severe cases of sinking fever, the patient would be dead before an operation from either of them could be procured. When the patient is soothed and quieted, some reaction is secured, which may be in one, two, or six days, then alteratives or laxatives, if necessary, can be used with caution.[1]

[1] In 1825, I heard of cases where a single dose of castor oil given after parturition brought on diarrhœa and dangerous sinking. For many months I prescribed

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When bile is vomited, very minute doses of calomel, one-twelfth or one-sixteenth of a grain every hour, will often control it, but in sympathetic vomiting it is useless.[1] Emetics or cathartics are seldom necessary or safe in this disease. The stimulating aromatic laxatives are often appropriate in the course of the treatment. It should always be remembered that whenever a movement of the bowels is necessary or desirable, it can be safely secured by enemata of turpentine.

The danger from depletion or active evacuants in low fevers, is a fact well established in the minds of most physicians in Connecticut, however they may be masked under the form of congestion or inflammation.

That there are cases of cerebro-spinal meningitis, where there is active inflammation that requires depletion, does not admit of doubt; but they are not those which we see during the prevalence of an epidemic of low sinking or spotted fever.[2]

The effect of drenching emetics and drastic cathartics in typhus or typhoid fever, as we find them in Connecticut, though attended with less sudden and fatal results, is scarcely less disastrous. I know the truth of what I affirm, for I have often seen patients in consultation whom I found at the time under a judicious treatment, but they were suffering from the pernicious influence of emetics and cathartics previously administered, which no subsequent treatment could remedy so as to prevent a fatal result. I have seen others at the same time, where emetics were not used, and cathartics, if employed at all, were given in guarded or alterative doses, terminate favorably.

I say nothing in opposition to bleeding, for I have known only one case of those low fevers bled, and that was fatal.

Stimulants.—Late experience has established the importance of the use of alcoholic stimulants in the form of brandy, spirit, whis-

in such cases only the mildest laxatives, usually the aromatic tincture of senna and rhubarb.

[1] I sometimes gave even smaller doses, and occasionally omitted them, supposing them too small to do good or injury, but if they were withdrawn too soon, the vomiting returned. Their use again would control it.

[2] The fact that in many epidemics similar to our sinking or spotted fever, which have prevailed in different places, resort has been had to depletion, emetics, and cathartics, has for a long time made me anxious that our experience in Connecticut should be made more public. I regret that it has not been done by one better qualified than myself. I am happy to learn that in Philadelphia, a rational practice has in most cases been adopted.

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key, wine, and wine whey; the last two only in mild cases. Milk punch is often agreeable and useful.[1]

For the last twenty-five or thirty years, we have regarded quinine as containing the febrifuge principle of the cinchona, and have used it freely in the early part of all typhoid diseases, and should give it much more freely in sinking typhus than we did forty years ago. At a later period, and during convalescence, we prefer the red bark in substance, tincture or infusion, combined with bitters and aromatics. The physicians in this vicinity, who have prescribed quinia in combination with morphia freely, that is, in doses of five or six grains every four hours, are confident that their patients are more sure of a recovery, and that this is more rapid than when under any other treatment.

I have neglected to remark, in the proper place, upon the importance of a nutritious diet in low fevers. The support and ultimate recovery of the patient depend largely upon the regular administration of suitable food. We adopt substantially the plan of the late Dr. Charles Hooker, as described in his "Article on Diet for the Sick," published in the eighth volume of the *Transactions* of this Association.

In conclusion, I would remark that these low fevers cannot be cured with placebos, though some are mild, and can be managed with a small amount of medicine; still, it is important that we keep in advance of the symptoms, anticipating and preventing, as far as possible, fatal sinking. They require a heroic treatment regulated by a wise discretion.

[1] Spirits of turpentine have frequently been used with advantage, by enema, in small doses not sufficient to move the bowels.

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REPORT

ON THE

MEDICAL TOPOGRAPHY AND EPIDEMICS OF CALIFORNIA.

BY

THOMAS M. LOGAN, M. D.,

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REPORT ON THE MEDICAL TOPOGRAPHY AND EPIDEMICS OF CALIFORNIA.

PRELIMINARY.

THE Reporter of the American Medical Association on the Medical Topography and Epidemics of California, while expressing his regret for having been unable to perform the duty assigned to him the previous year, respectfully presents the following facts and observations, embracing a period of six years, in continuation of a report he had the honor to submit in the year 1858.

In doing this he must first claim the privilege of expressing his acknowledgments to the few medical and scientific friends, whose names will appear in connection with their respective contributions, who have kindly given him their assistance. Without the material aid thus supplied, it would have been impossible to carry out the objects of the Association by the appointment in California, even in the present imperfect manner; for such has been the apathy manifested, that but very few and meagre responses have been received to a printed and widely distributed circular, detailing the character of the information needed, and soliciting the co-operation of medical men generally on the Pacific coast.

This indifference on the part of the profession in California to an organization, which, in its inchoate state, the sanguine Southerner[1] enthusiastically compared to "the sinking of a grand shaft into the imbedded wealth of the medical mind, from which the priceless ore, glittering with gems," was to be brought forth, cannot but be deplored, when we reflect upon the fortuitous concourse of representative medicine here met with, and the vast extent of hidden treasure waiting to be thereby opened up. Extending as California does, in its geographical dimensions, from near the 32½ to the 42d parallel, between the extremes of the rich perennial verdure of

[1] Beverly R. Wellford, of Richmond, Va.

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the tropics and lifeless barren wastes of sand, between sea-levels and altitudes where forests of gigantic growth crowd upon the confines of eternal snow; with its southeastern limits stretching off towards the 130th degree of west longitude into the table-lands of New Mexico, and laved by the Pacific Ocean on the west; when we further remember that it is made up of a succession of mountain chains and culminating crests, of lesser foothills and plateaus, of fertile valleys, of *tulares*, or marshes, of arid basins as well as of well-irrigated bottom lands; when we regard California thus, and observe its position on the meteorological chart of the world, we are prepared for the admission, that, inasmuch as its climatology must be as varied as the extent and diversities of its surface, so doubtless are to be found herein involved all the various problems of life and of death, of health and of disease, which the medical philosopher is called upon to solve.

Being thus, to some extent, a world within itself, possessed as California is of every element necessary to qualify it for the fit abode of the cosmopolite congregation which is now moulding itself, by virtue of its diversified constituency and complexity of action, into a rich organic unity, it may be the "synthetic type" of Guyot, "preparing a new era." It is manifest that no better field for the study of animal life in its cosmical relations can offer than in this concentrated sphere of activity. Where else may be found the elements of climate combined in proportions so congenial to the human system, and so favorable to the development and exercise of the intellectual as well as physical powers? What results may we not anticipate in an ethnological point of view, when constituent principles, so numerous and diverse, meet and react on one another?

It cannot be expected, however, that, with the lack of co-operation and associated labor just complained of, we can enter into anything like a full, systematic reconnoissance of a country where topographical accidents and metamorphoses are exercising the most unwonted effects upon the still stranger blending of different nationalities and races. At some future day, perhaps, to conclude the metaphor above quoted, "when our shaft shall have penetrated further and deeper into its recesses; when our tunnels and adits are completed, our machinery arranged, and our furnaces in blast, the American Medical Association will proudly exhibit its ingots of mental gold, the rich results of its labors and the glorious reward of its elevated and disinterested enterprise."

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The most that we can now humbly hope to accomplish is, by describing in a general manner such chorographic, climatic, and pathological phenomena as are known to be peculiar to certain regions, to convey some imperfect idea of the physical agencies recognized as capable of modifying the human constitution and its morbid developments, and thus endeavor indirectly to elucidate those obscure pathogenic influences which constitute the end and aim of all investigations like the present.

With such expectations, and under such difficulties, we venture then upon a course of inquiry which, although perhaps too vague in character and too comprehensive in range to suggest any indications by which epidemic visitations may be anticipated, or any means by which their virulence may be abated, will, nevertheless, we trust, conduct to the observation and recording of many interesting items in the domain of science. In the study and description of those natural phenomena which are supposed to be essentially concerned in the production of disease, we must necessarily treat of them as apparently isolated facts. Their relevancy may perhaps not be perceived, but isolated they cannot be regarded, for there is nothing that can be so considered in the universe. Every existence is a connecting link in the chain of being, and even "man," states Boudin, "is, in more respects than one, the mere expression of the soil on which he lives."

Writes the learned editor[1] of the *Sydenham Annals of Influenza:* "The material of mountain summits after various transformations becomes a part of the blood of animals. The coral reefs of the Pacific represent an admirable provision by which the proportions of some of the materials of the ocean are preserved. Preponderance of injurious genera in the insect world, or deficiency of others adapted for salutary offices in the economy of nature, may have no necessary connection with epidemics; nevertheless, they may yet have an indirect relation of mutual dependence on similar trains of physical change. Where we cannot detect relations of cause and effect, we may yet obtain a glimpse of truth in the study of concurrent series of phenomena. If recurring cycles of disease depend either on meteorological changes, or on disturbed conditions of life in the lower creation, however capricious, involved, and irregular such changes may appear, yet they are doubtless the result of principles as fixed as those which have been under the explanation of known physical laws. It is only by tracing the

[1] Theophilus Thompson, M. D., F. R. S.

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action of each distinct cause, that we can hope to deduce the ultimate effects of the combined operation of many causes. It is probable that after protracted chains of combinations are completed, the same series of events is repeated through boundless ages; and by perseverance in exact observation, we must not despair of being able hereafter to detect certain coincidences of aspect which mark the approaching recurrence of some small portions of the general series."

We have stated that the present is a continuation of a previous report, in which we brought up our account of the topography, meteorology, and diseases of the great Sacramento valley district, from its settlement in 1849 to the year 1858. Supplementing the facts since observed, respecting this interior portion of California, and which will be found chiefly in the accompanying tables and diagrams, we now purpose taking a cursory view of those two other parallel portions of the State, known as the coast region on the west, and the Sierra Nevada on the east.

TOPOGRAPHY.

Coast Region.—The first of the two latter divisions of California just mentioned, is made up of a succession of mountains and valleys interspersed with rounded hills, and watered by numerous streams and rivers.

The mountainous portion comprises two, three, and sometimes four parallel tiers or edges, with elevations from 500 to 3000 feet above the level of the sea, and peaks occasionally rising to 5000 and even 8500 feet, as we find Mt. San Bernardino at nearly the southern limits of the State; while Mt. Shasta, on the north, towers up to 14,440 feet. These various ridges extend, although not in unbroken continuity, throughout the whole length of the State, and form its prominent chorographical feature. Mt. San Bernardino, in lat. 34° 10′, may be regarded as the southeasterly initial point of the mountain system of California. From thence we have a well-defined main ridge, named after this mountain, running west-northwesterly to another peak, Mt. Pinas, in lat. 34° 40′, for nearly 150 miles, and at an average distance of 50 miles from the sea coast. North and south of the main ridge numerous short spurs set out at right angles with their primary. The most noticeable is the Santa Susanna, running in a west by south direction and bounding the county of Los Angeles. A little further we find the mouth of the Santa Clara River, about 34° 20′ lat., and crossing the valley

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we come to the Santa Inez coast range, running nearly due west for more than 60 miles to Point Conception, lat. 34° 30′.

From Point Conception northwardly the spurs or terminals of various ranges make up the greater part of the coast line; and here and elsewhere when they enter the ocean from the headlands and capes.

In latitude 35° we arrive at the Santa Lucia ridge. This ridge, like the Santa Inez, rises at but a short distance from the seashore, and extends to the small river Carmelo, a few miles from Monterey. Between the Santa Inez range and Mount Pinas, we have several noticeable features. Mount Pinas, while receiving the San Bernardino range, is also the terminal point of the Sierra Nevada, and Mount Diablo range; which latter may be regarded as the eastern limits of the coast ranges. In addition we have the Santa Barbara, or San Rafael Mountains springing from Mount Pinas, and forming the northern boundary of the Santa Inez River valley. Above this range we find the Guyamas valley and river, dividing the counties of Santa Barbara and San Luis Obispo, which also gives the name to another chain of hills and table land, radiating from the Mount Diablo range a little above Mount Pinas, in latitude 35° 20′. These trend in the direction of the Santa Lucia Ridge, which, as before stated, continues nearly to the city of Monterey.

The Santa Lucia ridge forms the southern boundary of the Salinas valley. This, the largest of all the coast valleys, being about 150 miles long by 40 broad, is bounded on the north by the Gabilan Ridge, which, at latitude 36° 10′, takes a northwestern direction, and is separated from the Santa Cruz range by the Pajaro River. It would indeed form the backbone of the counties of Santa Cruz, San Mateo, and San Francisco, but for the outlet of the Pajaro River.

Between the Santa Cruz and Mount Diablo ranges, we have the beautiful valley of the Santa Clara River, which, flowing through the flourishing town of San Jose, empties itself into San Francisco Bay. To the east of this bay the Diablo range divides itself, sending out a west-northwesterly ridge of foothills through Alameda to Contra Costa County; thence running east unites itself again to the northern tower of this chain—Monte Diablo.

Here the mountain system of Central California seems to terminate. On the west, as we have said, we have the Bay of San Francisco, on the north we have the waters of the Sacramento River enlarged to the bays of Suisun and San Pablo; and above

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them the broad expanse of the Sacramento valley. On the east we have the valley of the San Joaquin; and far away still more easterly, the colossal ranges of the Sierra Nevada, which we left at Mount Pinas, and which have swept their course around, continuing to the northeastern limits of the State.

Here, then, at Mount Diablo, we leave this section of the coast range, and, crossing the bay to San Francisco, post ourselves on the rocky range of the Santa Cruz ridge. Beyond is the Golden Gate, opening from the great Pacific highway into one of the most capacious harbors in the world—about 8 miles wide and 50 long—reaching from 37° 10′ to 38°. Connected with this bay are those of San Pablo and Suisun, lying farther inland, on the course of the outlet of the waters of the Sacramento basin. The former bay, which is nearly round and about ten miles in diameter, lies north of San Francisco Bay or harbor, with which it is connected by an unnamed strait, about three miles wide. Suisun Bay, about four miles wide by eight long, lies eastward of San Pablo Bay, with which it is connected by the Strait of Carquinez, which is a mile wide.

North of the Golden Gate, or entrance to San Francisco harbor, which is about a mile in width, the Gabilan ridge reappears, and separates the Petaluma valley from the Sonoma ridge; the Sonoma valley intervening between this latter ridge and the Carneros, which is again separated from the main coast ridge by Napa Valley.

Following up the country from the north of San Francisco Bay to Bodega, we find that it is made up of low mountains from Tomales to Bodega, which assume beyond this point to Cape Mendocino, Lat. 40° 20′, a more rugged and elevated character, being but a succession of ridges and cañons, parallel to the coast, trending to the north-northwest, with occasional small and fertile valleys. From thence into Oregon the whole line of coast trends towards the north, and is, generally speaking, inaccessible, and but little known. There are very few indentations forming harbors sufficiently large for vessels of any burden, and of these Humboldt, Trinidad, and Crescent City are the most important.

Northwardly from Cape Mendocino, the western belt of the coast range is no longer found running parallel with the coast, but the country is broken up into irregular mountain ridges and rolling hills, interspersed with many very fertile valleys, watered by lakes and small streams.

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Further north the ranges become so multiplied and extend so confusedly as scarcely to present a system of co-ordination. This disposition prevails particularly in that part of the chain north of Colusi, in which the counties of Humboldt, Klamath, Del Norte, Trinity, and the southwest part of Siskiyou are situated, and which collectively, form a portion differing materially in mineral aspect from the rest. The ranges here are divided by bold and rapid streams, and, as a consequence, are designated by local names, which serve to fix their geographical and relative positions; forming the boundaries of counties and lines of water-shed, which empty into the ocean at widely different and distant localities.

We have already stated that the main ridge, south of lat. 34°, is called the San Bernardino range; also that, near Mount Diablo, it takes the name of that conspicuous landmark. Now this main ridge, near the head of the Sacramento valley, becomes the Trinity ridge. This latter mountain range is important in a topographical point of view, inasmuch as it separates the waters which flow into the Sacramento from those which flow into the Klamath.

This last-named river drains into the ocean a portion of the waters belonging to what was formerly considered a part of the Great Basin, which consists, apparently, of an elevated plateau lying between the coast range and Sierra Nevada, north of Lassen's Butte; Mount Shasta being regarded as on the line of the eastern limit of the former range.

The coast mountains are steep, rocky, and rugged. Granite and analogous formations predominate in the whole range; but these have their beds like the other constituent materials of the terrestrial crust.

Professor J. D. Whitney, State Geologist, after recognizing at least three distinct periods of upheaval and metamorphic action in the coast mountains, has published the very interesting fact, that the exterior, or coast ranges nearest the Pacific, are of earlier date or older geologically than the interior ones, or those which border the Sacramento and San Joaquin valleys. This, he farther states, is a repetition on a smaller scale of what has been the course of events in the formation of the whole continent—the exterior lines having been first marked out and the interior filled up afterwards.[1]

North of lat. 38°, especially towards the interior, the mountains are more or less covered with timber and brush. South of this

[1] American Journal of Science and Art, Sept. 1864, p. 258.

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point the ridges nearest the ocean have some timber, while those farther inland are nearly bare. In several parts of the entire range, between the valleys and the mountains, the rounded foot-hills are covered for many miles with a close growth of wild oats and other farinaceous grasses, affording excellent pasturage for herds of wild cattle, elk, antelope, deer, etc.

We have already mentioned the names of many of the most important valleys, in an agricultural point of view, dividing certain ridges of the coast mountains from each other. The average width of these coast valleys is about five miles at the mouth, with a length of from ten to forty miles, narrowing to a point near their head in the mountains. The Salinas valley, above mentioned, is ninety miles long, and from eight to fourteen wide. Three terraces are distinctly traceable on each side of the river. The first and lowest is about four miles wide, of a sort of rich sandy loam; the second rises with an abrupt edge, eleven feet high, and is made up of a coarse, poorer soil for two miles on each side; the third terrace is less regular in height and width, and possesses a coarser gravelly soil, scarcely fit for cultivation. This terrace formation, with its variation of soils, which was mentioned in our former sketch of the Sacramento valley, is a strongly-marked feature of most of the valleys in the State. There are some exceptions to the general co-ordination of these coast valleys and mountains. Thus, there is a low plain between Russian River and Santa Rosa Valley, which opens into Sonoma and Petaluma valleys; and again, the Santa Clara and Pajaro valleys are separated by hills not more than 250 feet high. So also the division between San Ramon and Amador valleys is so low as scarcely to be observable.

The hydrography of the coast range region is peculiar. With the exception of the Salinas, the only navigable stream south of San Francisco Bay, and the Russian, Eel, Elk, Mad, Smith, Klamath, and Trinity Rivers north of the same point, all permanent, but not all navigable, the rivers of the coast mountains, though sometimes large streams in the winters, are, for the most part, swallowed up in the sands before reaching the ocean. For example, the Santa Anna, the largest river on the southern coast, rises in Mount San Bernardino, and although in its meanderings is nearly 100 miles long, only in very wet seasons succeeds in reaching the sea. The San Gabriel sinks before reaching Monte, in Los Angeles County, and after passing three miles under ground, rises again. The intervening space where the river disappears, is very moist

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sandy ground, through which the water spreads and soaks. The point at which water ceases to flow, according to Lieut. Emory,[1] "is quite variable; its more usual up-limit being marked at or near the passage of the stream from the first rocky ranges into the tertiary formation. The point, however, is by no means a fixed one: thus, during the night it extends further downward than in the daytime; in cloudy weather, for the same reason, its course is more prolonged than under a clear sky. In the stream beds themselves, however dry, water is generally found a short distance below the surface."

The rising and reappearance of the springs and watercourses in California after the drought of summer, and before the rainy season sets in, have long been the subject of popular remark. In the bi-monthly report of the Agricultural Department, U. S., for Sept. and Oct. 1864, it is stated that the same observation has been made in the Eastern States, at the close of severe droughts; and the cause is readily found in the change from dry to moist winds. There being less evaporation of the springs and rivulets, which are fed by the subsoil moisture with a uniform supply, there must be an increased volume of water in them. In California, as the wet season approaches, the power of the sun diminishes, and hence the constancy of the phenomenon. There is another feature of the scenery of our plains, observed by Dr. Henry Gibbons. "In the autumn, after travelling five or ten miles without meeting with a drop of water, or any growing vegetation, you observe a clump of green willows in the bed of what appears to be a 'dry creek.' You find there a pool of water; and, perhaps, in the course of the bed other pools will be found, where a good supply of water is always on hand in the driest season."

Among the hydrographical peculiarities Clear Lake stands out most prominently; indeed, it is the only collection of water worthy of the name of lake in the coast range district. Situated at a considerable elevation, between the 39th and 40th parallels, this beautiful mountain lake lies in a deep basin, with an outlet to the eastward, where its surplus waters are carried off by Cache Creek to the Sacramento. It is about twenty miles long, varying in breadth from two to ten miles, and is surrounded by a valley of fertile land; the vegetation of which is abundant and vigorous,

[1] Report of the Mexican Boundary Commission.

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affording, during seasons of great drought, like that of 1863–4, fine pasturage for herds of cattle.

The numerous chalybeate and other springs, situated in different points of the area under consideration, next claim our attention on account of their interest and importance, especially the Geysers of Napa, and the adjacent regions which are among the most curious of the many volcanic springs here met with. The most remarkable of these *intermittent springs* are located some fifteen miles south of Clear Lake, on the north bank of Pluton River, a tributary of the Russian, which runs through a deep gorge. The scenery is described by Drs. Winslow and Bartlett as grand and sublime beyond delineation, and which nothing but some violent convulsion of the earth at a remote period could have produced.

"From a high peak,[1] we saw on the west the Pacific, on the south Monte Diablo and San Francisco Bay, on the east the Sierra Nevada, and on the north opened at our feet an immense chasm, from which, at the distance of four or five miles, we distinctly saw dense columns of steam rising. Descending, we discovered, within half a mile square, from one hundred to two hundred openings, whence issued dense columns of vapor to the height of from 150 to 200 feet, accompanied by a roar which could be heard for a mile or more. Many acted spasmodically, throwing up jets of hot scalding water to the height of 20 or 30 feet. Beneath your footsteps you hear the lashing and foaming gyrations; and on cutting through the surface, are disclosed streams of angry boiling water."[2]

Bartlett states that the action at this particular spot had subsided almost entirely at the time he visited it; but he mentions other fissures on the sides of banks and mountains, generally formed of decomposed rocks, which emit strong currents or jets of heated air and steam, with a noise resembling that of vapor escaping from ocean steamers, and likewise cavities with boiling water, which rose and fell, accompanied by a loud gurgling sound. "In one of these cavities, stones as large as an egg were in a state of commotion, presenting a curious resemblance to a pot of boiling potatoes. I held my hand fifteen inches above this boiling pot, at which distance the water scalded it. From this cavity to the running stream was just the width of my hand; though the surface of the boiling water in the cavity was about a foot from the running water."[3]

[1] Putas Mountain, also called Bald Mountain.

[2] Silliman's Journal for November, 1851.

[3] Personal Narrative, &c. By John Russell Bartlett, U. S. Commissioner, vol ii. p. 41, 1854.

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We conclude our brief account of these extraordinary springs, with one more extract from Professor Shepherd: "Here may be found sulphur water precisely similar to the celebrated *white sulphur* of Green Brier County, Virginia, except its icy coldness. Also red, blue, and even black sulphur water, both cold and hot. Also pure limpid hot water without any sulphur or chlorine salts; calcareous hot waters, magnesian, chalybeate, etc., in almost endless variety. Every natural facility is afforded for either vapor, shower, or plunging baths. Where the heated sulphuretted hydrogen gas is evolved, water appears to be suddenly formed, and beautiful crystals of sulphur deposited (not sublimated as by fire), and more or less sulphuric acid generated. In some places the acid was found so strong as to turn black kid gloves almost immediately to a deep red."

It does not come within the scope of our object to enter into a fuller or more philosophical discussion of a subject so purely scientific as these springs. In support of our already expressed opinion, however, that they are the result of the sinking of cold *meteoric* water into contact with a volcanic focus, we adduce the following observation by Humboldt in his *Cosmos:*—

"When, in September, 1759, Jorulla, in Mexico, was suddenly elevated into a mountain 1183 feet above the level of the surrounding plain, two small rivers, the *Rio de Cuitimba*, and *Rio de San Pedro*, disappeared, and some time afterward burst forth again during violent shocks of an earthquake, as hot springs, whose temperature I found, in 1803, to be 186°.4."

Whilst the importance of these springs, in a hygienic point of view, cannot be too highly estimated, they, nevertheless, sometimes prove a source of injury, if not of disease to the human constitution. During the long and excessive drought of 1863–'64, much of the water descending from the mountains, especially in the southern parts of the State, both in springs and wells, contained so large an amount of mineral substances as to affect sensibly the urinary organs of both man and beast. The cattle and sheep that were driven up into the mountains for pasturage, died in great numbers, and many of those that survived became so impoverished, and in such bad condition as to render them unfit for food. In this way, doubtless, they proved a prolific source of disease to those who were obliged to subsist upon them.

From this brief description of the coast-range region, it is in order to proceed to the next division of our subject; in doing

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which we will incidentally continue to treat of the Sacramento valley in its connected relations with

THE SIERRA NEVADA REGION.

The mountain chain of this portion of California runs for about 450 miles from the San Bernardino Mountains in a north-northwesterly direction, with a varying breadth of about 70 miles, and a height of from 5000 to 10,000, and even 14,000 feet above sea-level.

The western slope, which descends to a level of about 300 feet above the sea, constitutes the greater part of its whole width; for the eastern slope terminates more abruptly in the Great Basin of Utah, which is itself from 4000 to 5000 feet above the sea.

The greatest proportion of the snows and rains that visit the Sierra Nevada falls on its western slope, whence flow all the large rivers. These rivers run westward, nearly at right angles to the course of the chain, and cut it into steep hills and deep ravines, cañons and chasms.

The valleys are all so small that it is rare to see a hundred acres of level, arable land, even on the banks of the largest mountain streams. About latitude 40° the Sierra Nevada seems to divide or fork: one branch running northward, in the line of the main chain, the other northwestward to Mount Shasta. Between these two branches, and between the 40th and 42d parallels, is a succession of high table-land or plateau. The district bears a strong resemblance in many of its features to the Great Basin of Utah, with which it should perhaps be classed; and is chiefly drained by the Pitt River, or the upper Sacramento River, which starts in the northeastern corner of the State, and descending from the Goose Lake district of the Sierra Nevada, breaks through this plateau, and forcing for itself a channel through the Pitt hills, ultimately severs the Lassen's Butte, or western Sierra Nevada range from Mount Shasta. The drainage area of the Pitt River Basin equals fully 9000 square miles, and is singular in its conformation throughout. For the greater part it constitutes a high plateau, some 4000 feet higher than is attained at Shasta City, and through walls of volcanic rock, for nearly 100 miles, the river has cut itself a cañon, descending by a succession of plateaus to the western chain of the Sierra Nevada.[1]

[1] Pacific Railroad Exploration Reports, vol. vi.

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As a water-shed this Pitt River Basin, by means of its greater altitude, is of nearly equal importance to the larger area running south from Lassen's Butte to the San Joaquin River; for the rainfalls and snows over its whole area are hardly less than threefold greater per mile, than the average of the more southern basin drained by the Sacramento River. Supposing, therefore, a high freshet in the southern water-shed equals three inches per day, and would produce over its whole area of 27,000 square miles, 188,179,200,000 cubic feet of water, and the same freshet equalled nine inches in the Pitt River, or Cascade range district for 9000 square miles, we should have to double the amount above stated in estimating the whole of the probable amount of water brought down by day while the storm lasted.

According to this, the two basins would yield the enormous quantity of 376,358,400,000 cubic feet of water, which would fill more than seven channels, each 400 miles long, and 500 feet broad, and 50 feet deep; or, in other words, it would require more than ten times the capacity of the Sacramento River to carry it off, without overflow; assuming the principle, as an approximation, that it may take the same time to run out that it runs in.

In its course towards the ocean, this water parts with its velocity every moment by friction against air, rocks, banks, curves, the bottom of the channel, and other resisting media—hence affording time for important changes to be effected before it reaches the more level parts of the valley.

In the region of the lower Sacramento, the rain, the filtration-water of the river itself, and the watercourses, in time of high water, do not run *into* but *from* the river, and consequently they carry off into the *tulares*, or marshes, and lowlands—animal, vegetable, and mineral matters capable of solution, suspension, transportation, and putrefaction. Hundreds of miles above the city of Sacramento, the tributaries of the river—every swollen brook, rivulet, and stream reach the larger affluents charged with these matters, which during its journey towards the south, under the influence of a hot sun, undergo great modifications. New chemical compositions and decompositions must occur—the heavier debris sinking, and mineral and other matters being newly combined. Hence every condition exists favorable to the dissipation of deleterious gases arising from the putrescible matter in the water; and accordingly we find this whole region infested with intermittents. But though loaded with detritus on reaching Sacramento City, the

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river water, having undergone self-purification, becomes comparatively pure and salubrious—the more so, because the lower Sacramento is no longer a sewer to receive filth—the drainage during floods being in the opposite direction.

We have thus dwelt somewhat upon the drainage area of the Sacramento River, because we believe that it is virtually not only the chief commercial and physical feature of the great internal valley of California, but because it is probably the principal element, whether for good or for evil in its medical topography and hygiene. May not the comparative exemption from fever of the lower region of the valley be in some degree owing to the hygienic influences of this river? or to the analytically proved purity of its waters? or to its inundations during the winter and spring, and the cooling effects of evaporation from the vast expanse of overflowed land—*tulares*—during the summer?

In reproducing, therefore, these contributions, as well as the following thermometrical data relating to the physical history of the river at Sacramento, prepared by the reporter, and published in the May number of the *Pacific Medical and Surgical Journal* for 1864, it is hoped the attention of abler observers will be directed to a subject of such vital importance. The influences of inundations in both urban and rural districts deserve careful study in etiological, hygienic, and sanitarian points of view.

It will be observed that the contemporaneous temperature of the air and of well-water is also included for comparison:—

Monthly Mean Temperature.

	River.	Wells.	Air.
January	45°.00	57°.00	45°.59
February	49.75	57.33	50.86
March	50.75	57.33	54.02
April	56.00	57.25	59.45
May	60.00	60.00	63.12
June	72.00	59.00	70 35
July	74.66	59.00	73.45
August	61.33	59.00	71.03
September	70.00	59.33	68.84
October	64.66	58.00	62.56
November	49.66	59.00	53.26
December	44.66	57.00	46.79
Means of ten years,	58.20	58.18	59.91

It will be noticed in this table that the uniform temperature of well-water forms a strong contrast with the changeful alterations

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of the river and the air. While, however, the marked horary change in the air which is not shown by the table, is enormous, that in the river is scarcely perceptible. Neither the maximum nor the minimum in the latter is ever found as great as in the former. The nearest approximation between the river and the air occurs at sunrise, or in the night. Yet, notwithstanding the difference in maximum, minimum, horary, and diurnal, the annual mean of both, as shown in the table, is nearly the same, and coincides with that of well-water. Any marked diurnal or weekly change in the river, which, however, is extremely limited, is not so much owing to atmospheric changes as to the sudden rises and deliveries of its tributaries, more or less charged with melted snow and ice, as occurs in many other rivers. Humboldt says that for 27° latitude on both sides of the equator the temperature of the equinoctial seas is almost entirely independent of the atmosphere, being 83° to 84°; while the mean of the equatorial air is 79 to 80 degrees.

Following up the hydrographical features of the region under consideration, we find, near the sources of the Pitt River, Goose Lake and Lower Klamath Lake partly in Oregon and partly in California. Wright and Rhett lakes are situated between the two just mentioned. Farther south, and in successive order, we find Holloway, Eagle, Thalia, and Honey lakes, besides many others of smaller dimensions in this elevated region. Into the latter, Honey Lake, which is twelve miles long and five wide, Susan River empties after a course of about forty miles in an eastwardly direction from Lassen's Butte.

Besides these, there are numerous other mountain lakes, which it is not important to mention. Lake Bigler, however, now called Lake Tahoe, cannot be passed by without remark, for a geological interest is fastened upon it. There we see what so many other of the great valleys of the Sierra Nevada once were.

Situated in a valley at the eastern base of the central ridge of the Sierra Nevada, and at an elevation of some 6000 feet above the level of the sea, it is surrounded by mountains, which rise from one to three, and perhaps, in some cases, 4000 feet above the surface of its water. These mountains are principally composed of friable white granite, water-worn to that degree, that, although they are rough and often covered with rocks and boulders, yet show no cliffs nor precipices.

Their bases of granite sand rise in majestic curves from the plain of the valley to their steeper flanks. Many of the smaller

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hills are but high heaps of boulders; the stony skeletons decaying *in situ* half buried in their granite *debris*. The dimensions of the lake, according to Goddard, who explored its southern shores during the State Wagon Road and Boundary Survey of 1855, and determined its extreme southern latitude at 38° 57′, and of whose description we here avail ourselves, can hardly exceed twenty miles in length by ten in breadth.

"The shores, at least of its southern coast, are entirely formed of granite sand, while a dense pine forest extends from the water's edge to the summits of the surrounding mountains, except in some points, where a peak of more than ordinary elevation rears its bald head above the waving forest. An extensive swampy flat lies on its southern shore, through which the upper Truckee slowly meanders, gathering up in its tortuous course all the streams which flow from the south or southeast. This little stream, though but of yesterday, geologically speaking, has yet carried down its sandy deposits through ages sufficient to form the five miles of valley flats, from the foot of the Johnson pass to the present margin of the lake, and still the work progresses. The shallows at the mouth of the river are stretching across towards the first point on the eastern slope of the lake, and at the same time the water level of the lake is evidently subsiding."

The deep blue color of the water, which is perfectly fresh, indicates considerable depth. It is well stocked with salmon, trout, and other fresh-water fish. A well-ordered sanitarium on the shores of this lake, with all the improved adaptations and appliances which modern hygienic science exacts, would prove a marvellous boon to both patients and doctors, especially during the summer months, when the climate of San Francisco and the coast region proves so harsh for invalids, particularly for such as have weak lungs.

Imperfect, as we are aware, this hurried chorographical sketch is, it would fail still more to convey an adequate idea of the region under consideration, were we not to allude, in this connection, to a large tract of country allied in its geology and climate to California, and now comprising the State of Nevada. Throughout its entire western side, the Sierra Nevada Mountains wall it in and separate it from the State of California. Parallel to the Sierra Nevada, and having the same trend, viz., about 20° east of south and west of north, are numerous lower ranges of mountains, covering with their intervening valleys the whole State. These mountains

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have an altitude of 2000 or 3000 feet above the adjacent country, are formed with considerable regularity, and are separated from each other by basin like valleys, varying from ten to twenty miles in width, which is also about the average width of these ranges measured over their summits. Through the centre of these valleys usually runs a river or small stream, though in many instances they are devoid of running water, except perhaps a few temporary rills, caused by the melting snow or the rains of winter. Some of these valleys expand into wide-spread deserts on which not a drop of water is to be found except by digging, and even then, at only a few points, and which is generally so impregnated with the alkaline salts as to be scarce fit for use. Nevada is a desert, not so much on account of its poverty of soil, for large sections of its sage-lands could be rendered fertile by irrigation, but because of its excessive droughts and want of moisture. Hence also the scarcity of its lakes and running streams; it being wholly without navigable waters. "It is a feature of the rivers that they scarcely increase in size throughout their whole length, owing, in part, to the rapid evaporation going on in the climate, and in part to the free absorption of water by the dry and porous earth. The Carson River is not perceptibly larger at Fort Churchill," states Surgeon Charles C. Furley, to whose valuable Sanitary Report we are indebted for this portion of our topography, "than at Genoa, sixty miles above, nor is the Humboldt of greater volume at its sink than two hundred miles towards its source. Another peculiarity of these rivers is, that the water constantly deteriorates as we go down them, owing to the accumulations of the alkaline substances from the country through which they flow. The waters of the Humboldt, palatable and wholesome near its head, are bitter and deleterious in the vicinity of the mines near that stream. As the season advances, the water in the streams, impregnated with alkaline salts, sulphur, etc., grows worse. In the spring and early summer, when these streams are swollen by the rains and melting snows, the water is much better than after they have been reduced by the dry season." Reverting now to the elevated plateau in the California range, we proceed to consider, more especially, the altitude of the peaks and crests, as well as some of the numerous basins found therein.

Mount Shasta, of which we have already made mention, as standing midway between the coast mountains and the Sierra Nevada, and which is connected by high mountain ridges with both of them, rises, at lat. 41° 30′, high into the region of perpetual snow. Its

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height as already given, was fixed by Professor Whitney, at 14,440 feet above sea-level, and it was supposed to be the highest mountain within the limits of the United States.

More recently Professor Brewer, in the prosecution of the geological survey in the southern part of California, has discovered that the crest of the Sierra rises very high for a distance of more than 100 miles, and that between the head-waters of the King's and Kern's Rivers (lat. 36° 3′ to 37°) the culminating mass occurs. The highest peak is probably 15,000 feet high. One of the surveying party, Mr. King, reached the height of 14,729 feet. This fact was unsuspected before, and makes these mountains the highest in the United States.[1]

One of the prominent features of the California range, to which we have alluded, is found in the numerous basins: these afford irrefutable evidence of their volcanic origin; being only so many old craters. In 1848, Fremont, for the first time, laid down on his map the Great Basin of Utah, then a portion of California; and it was at the time supposed to be the only topographical feature of this character within the compass of North America. Further explorations, however, have since shown that many of these basins are found within, as well as to the south of our ancient frontiers—the most important of which we have only time to touch upon. The great Utah Basin itself contains innumerable imitations of its general features within its own capacious bosom, and all its streams flow towards a central line of concavity. Bounded on the north by the basin of the Columbia, on the southeast by the basin of the Colorado, and on the southwest by the Sierra Nevada and San Bernardino Mountains, this elevated tract of land, most of which is 5000 feet above sea-level—mountainous, barren, and cheerless, with no outlet for its waters—extends into California, including a district about 200 miles long and 100 wide, towards the southeastern portion of the State. This arid and most sterile region is cut up by innumerable ridges of bare, rocky mountains, with intervening valleys of sand and volcanic scoriæ. Here and there occasional springs and little streams, terminating in lakes, are met with, presenting after heavy rains a wide extent of muddy saline water, and, in the dry season, wide beds of dried and cracked mud—covered with a white alkaline efflorescence. The chief stream in the Californian portion of this great basin is the Mojave, which rises on

[1] American Journal of Science and Arts, January, 1865.

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the northern slope of the San Bernardino range, and, after running about 100 miles in a northeast direction, sinks in the sand. After sinking, it rises again—or rather pools of water are found in the low places of its bed; the water evidently soaking through the sand and following the bed of the stream: a characteristic of most of the rivers of this region. Nearly on the parallel of the southern rim of the Great Basin is Owen's Lake, into which the river of the same name drains, after running southward about 75 miles along the eastern foot of the Sierra Nevada. About 100 miles north of Owen's Lake is Mono Lake, sometimes called the "Dead Sea of California," the water of which is so heavy with saline substances, that the human body floats in it, and no fish are found therein. While the greater part of the Utah Basin is high above, there is a portion of it, called "Death Valley," said to be some 300 feet below the level of the sea. It is situated at the southern watershed of that basin of deserts, where the slope from the crests of the Kern River Mountains looks east-southeast, and connects in table-land bluffs, peaks, etc., with South Sierra Nevada of Tejon. Although looking from the gulf in the south, this elevated region seems high, it is merely on a level of some 3 to 4000 feet, whereas, coming from the ocean to the Sierra Nevada crests, the ascent in 100 miles is as much as 10,000 feet. This difference is remarkable; for while, as has already been stated, the eastern descents of the Sierra Nevada (and especially is this so in the locality of Lake Tahoe) are very steep, still in crossing the low divide, parallel with the Armagosa from the south, you ascend gently and descend as gently into the edge of the inner cup. The Armagosa is included near the junction of Tulare and San Bernardino counties, where the Bernardino ranges, and the volcanic sierras infringe upon the Colorado, and shut off or press in a number of singular basins or craters, which are all separated from each other, and of lessening magnitudes as they narrow southward towards that of Cariso Arroyo. This district, as exhibited on the latest maps, between the parallel of Owen's Lake and the New River of the Colorado, may be compared to the figure of a pear, with the largest end towards the northeast, and the small end towards the southwest. It is one of the most desiccated arid districts on the face of the globe, and its aspects are most dreary and melancholy. Its extreme length from the Dead Sea parallel to Cariso is estimated at 300 miles—the Death Valley, with the 300 mile Big Cañon of the Colo-

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rado, situated therein, being among the geographical wonders of North America.

The last of the districts in this connection to be noticed is the *Colorado Desert*, about 70 miles wide by 140 long, situated at the southeastern border of California, and belonging to the basin of the Colorado River. It is called a desert because of its barren, sandy soil, and scanty vegetation—thorny cacti and arid shrubbery, such as the *Larrea mexicana*, *Fouquiera splendens*, etc., usurping the soil. In Emory's "Report of the U. S. and Mexican Boundary Survey," Dr. Parry states: "On leaving the last rocky exposures to enter on the open desert plain, we pass some distance down the bed of Cariso Creek; along the course of which are exposed the high bluffs of sand, marl, and clay, exhibiting a fine sectional view of the tertiary formation on which the desert plateau is based. At the point where the road leaves the bed of the creek, to mount to the desert table-land, some 150 feet above, fossil marine shells of *ostrea* are found, and gypsum makes its appearance in extensive beds. The upper layer of the table-land shows a variable thickness, composed of water-worn pebbles, derived from the adjoining mountains. Near the mountain base, this plateau has a height of about 500 feet above the level of the Colorado River. The surface extends in a gentle slope towards the Colorado, or eastward, about the distance of 25 miles, where it reaches its lowest depression at the Lagoon or 'New River' Basin, which is in fact a part of the extended alluvial tracts belonging to the Colorado River. The proof of this latter fact is seen in the barometric observations, showing a depression at this point, below the level of the Colorado River in high water, and also by tracing a direct connection between the overflow of this latter stream and the appearance of water at New River." A singular matter connected with the Colorado River, since the American settlement of California, is that *a river was made in the desert*, by the heavy rains and snows from Dec. 1848, to Jan. 1852, called "New River," which forced back the overflowing of the Colorado into a basin and dry river bed, some hundred miles or more toward the northwest. The connection of this basin with the New River lasted several years, when its mouth was again blocked up by drift and sand bars from the Colorado, very likely assisted by the then prevalent earthquakes of that district. It is supposed that at one time the Gulf of California extended several hundred miles further north than it now does, and the Colorado River in long ages deposited so much allu-

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vium as to make banks down to the present head of the gulf—thus cutting off from its connection with the ocean that part of the gulf now dry. As the evaporation in this desert far exceeds the fall of rain—so it was not long before this lake was dried up. In lat. 30° 20′, and long. 115° 50′, is found a portion of the desert, about 30 miles square, or more, which is estimated to be about 70 feet below the level of the sea. In this locality some remarkable mud volcanoes are to be seen, covering a space of about a quarter of a mile long and an eighth of a mile wide. This area is of soft mud, through which hot water and steam are constantly escaping. The vapor rises steadily in some places, with a hissing noise; in other places it bursts out with the noise and action of an explosion, throwing mud a hundred feet into the air with a loud report. Some of the springs are surrounded by incrustations and arborescent concretions of carbonate of lime—others are encircled by deposits of sulphur. There are places where the mud is in constant movement and rises in great bubbles, bursting, as if boiling from intense heat; while in other places regular cones, apparently hardened into permanency, have been formed into shapes varying from low hillocks to sharp points. The whole earth is soft in this vicinity, and frequently the crust is broken and thrown up with great violence to establish new springs, steam-vents, and mud-cauldrons—consequently it is not safe to approach too near. The air blown from the valves is fetid with sulphur.

Besides these solfataras, and the geysers, in Sonoma, already mentioned, there are several places in California where, from the heated earth, sulphurous gases and vapors are always escaping. In the northeastern part of Plumas County there are a great many hot springs covering an area of ten acres. Their hissing and noise can be heard at the distance of a mile, and their steam can be seen for a greater distance. The whole place smells strongly of sulphur, which mineral, as well as alum and various earthy salts, abounds. It was rumored in 1858, that there was an active volcano in Plumas County, near Lassen's Peak, but there was no satisfactory proof of the truth of this report; though there is a portion of country in that vicinity of which very little is known. About one hundred yards west of the summit of Mount Shasta there are about a dozen steaming hot sulphur springs, and the earth about them is so hot as to be unpleasant.

Geologically considered, California belongs chiefly to the palæozoic and tertiary formations. Carboniferous rocks have as yet

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been discovered to a very limited extent. A tertiary sandstone, some of which is metamorphic, having apparently lost its original stratification under the influence of intense heat, underlies the valleys of the Sacramento and San Joaquin, and of the coast, and is also found in the Coast Mountains, the Great Basin, and the Colorado Desert.

About Mounts Shasta and Lassen, Castle Peak, the Marysville Buttes, in the plateau of the Sierra Nevada, the Great Basin, the Colorado Desert, and other points, there are considerable tracts of basalt, lava, trap, trachyte, etc. Along the sides of the Sierra Nevada, near the line of separation between the sandstone of the valley and the granite of the higher parts of the mountains, are found various other rocks, among which slate, quartz, and limestone are prominent. Some coal, much of it a lignite, has been found in various parts of the coast region.

The limited time at our command will not permit us to enter into the further consideration of this subject, or any other of a kindred nature, such as the mineralogy, flora, fauna, ethnography, etc., usually discussed in reports like the present. To the Climatology and Epidemiology, which are more immediately connected with pathogenetic medicine, we now purpose confining our special attention.

The total area of the whole region, which we have endeavored to describe in this general manner, amounts, according to the estimate made by Hittel (of whose work on "The Resources of California" we have freely availed ourselves), to about 155,000 square miles; of which there are 42,000 in the coast mountains and valleys, 40,000 in the Sierra Nevada and its plateau, 20,000 in the lowland of the Sacramento Basin, 30,000 in the Great Basin of Utah, 15,000 in the Colorado Desert, and 8000 in the Klamath Basin; the last estimate of 8000 miles falling below our computation.

CLIMATOLOGY.

In the former report, already referred to, our object was to establish in the first instance, as far as the nature of the case permitted, the meteorology of the capital of the State, and which subsequent data, presented in the accompanying tables and diagrams, have confirmed—Sacramento being so centrally situated, as to

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represent with an approximative accuracy the whole of the lowlands of the great interior basin. We say *approximative*, because, although the tendency of errors and accidents to balance each other authorizes us to entertain the greater confidence in the conclusions drawn from such tables, still it is in the highest degree probable that they would be much modified by more numerous series of observations at different stations within the area thus represented. Indeed, when we reflect that a thermometer, removed but a few hundred yards from its first position, differs not unfrequently five, sometimes even ten degrees, in its readings; and that the annual fall of rain on the roof of the Observatory at Paris is two inches less than on the ground by the side of it, we see at once how very imperfectly acquainted we are with the means and extremes of temperature, or the precipitation and the evaporation—the climate, in short, of any extensive region on the face of the globe. And if such is the case, as the progress of science has actually demonstrated respecting countries most densely peopled, and best supplied with instruments and observers, how inaccurate, in a strictly scientific point of view, must be deductions, drawn in California especially, from points so widely apart, such as we are necessarily confined to at this time.

Perhaps in no other part of the world will there ever be found such a multiplicity of climates curiously pitched together, at short distances, one from another, as are here met with. In the three parallel strips, into which we have divided up the State, for the purpose, if possible, of some sort of systematic description, subordinate local differences of climate, the most remarkable, are found resulting from subordinate features in the local configurations—particularly in the seaward strip or portion. Thus we find in the western slope of the coast range, between Point Conception and Cape Mendocino, a multiplicity and confusion of climates almost indescribable. South of Point Conception quite a different character of climate obtains. So with the elevated Sierra Nevada and Klamath basins and plateaus the climatic features are totally changed; while the climate of the Great Basin of Utah and the Colorado Desert are as distinct from each other as they are from all the others.

The immediate efficient cause of these complex atmospherical conditions has so little direct connection with the effects of latitude and altitude and the defences of mountain ranges, that it will only be necessary to refer generally to those topographical peculiarities

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already described, which from their prominence seem to suggest a causative relation. The most obvious hypothesis would attribute it to a causation, which is probably itself the co-efficient of two elements—the sea-winds and the temperature of the land-air—the properties of the one, and the conditions of the other. With respect to the former of these two elements, the sea-wind, observation and experience point to a deep sea current from the polar regions of great magnitude and volume, which appears only by the lifting of its waters on approaching the coast of California, and in the general refrigeration of the waters of the whole area.

The body of water affected, as shown by Maury's Charts, extends northwestwardly towards the peninsula of Alaska, and is found strikingly uniform in its characteristics of low temperature, absence of surface currents, and continuous northwest winds. This great mass of cold waters, and its attendant cold surface atmosphere develop a strong sea wind towards the heated and rarefied interior valleys and plains, and where these contrasts of temperature are greatest, the maximum effect is produced as at San Francisco.

This hypothesis, attributing the community of causation of the coast climates to the temperature of the land air and that of the water of so large a portion of the ocean is further sustained by the fact, that the contrasts which induce these violent sea winds exist only in the summer months, including May and September, as at other seasons the temperature of the ocean is raised by a warm current flowing across from the China Sea, while the land becomes colder; and whatever the degree of aridity, the sudden and extreme rarefactions do not occur in the interior. The spring and autumn are, therefore, both warmer than the summer on the immediate coast. In the winter, the reverse of all this takes place. The sierras are now covered with more or less snow, which extends down to their bases, whitening also not seldom the great valley which has become colder than the coast region; while the southeast trades, charged to their utmost capacity with moisture, commence descending as their temperature decreases, and precipitate more and more rain as they become chilled by the cold northerly winds. During the summer, owing to the fact of these polar breezes passing over a highly heated and arid surface, their temperature is raised, thereby increasing their capacity for moisture, which not being able to obtain from the surface passed over, they appear as dry winds, reminding us of the reputed sirocco of Italy. Dry, however, as these winds apparently are, on coming in contact with the westerly

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winds chilled by the oceanic polar current, and their temperature being again reduced, the vapor they contain is rapidly condensed; hence the heavy mists that are precipitated during the afternoon at San Francisco and at the gaps along the coast.

With the understanding of these facts, the varieties and anomalies of the California climates, especially of the coast, will become more intelligible; so we now proceed to the discussion of the meteorology of San Francisco and its surroundings as the type of the first division of our subject.

SAN FRANCISCO AND COAST CLIMATES.

San Francisco does not lie immediately on the ocean, but six miles from it, in the bay of the same name, as has been already stated, where there is a great gap, the Golden Gate, which gives free admission to the sea winds and attendant fogs or mists. This bay is a large salt-water lake in the middle of a much larger land lake, sometimes called the San José valley. It extends south of the city some forty miles, and northward about twenty-five more, if we include San Pablo Bay. Now the smaller valleys opening into this larger valley of the bay, in fact, most of the valleys embosomed in the coast range already described, though having each a peculiarly modified climate of their own, and productions corresponding, all partake more or less of the characteristics of the climate of San Francisco, the shades of difference being caused by the great equalizing power of the ocean and the greater or less exposure to it. The Pacific winds are very nearly calculable quantities, and by them are determined to a great degree the temperature of places, the rains, the growths also, as respects both their rates and kinds, and the almost uniform salubrity. The nearer the Pacific, the denser and more frequent the fog, the stronger the winds, the warmer the winters, and the cooler the summers. In fact every degree of temperature, from the heat of the torrid zone to a chilling cold, can be found at short distances from each other near the level of the sea.

Sacramento is eighty miles from the ocean, Benicia forty, Napa thirty-five, Sonoma thirty, Petaluma twenty, San Rafael ten; and according to their respective distances from the ocean is the climate of each of these places graduated in the summer. At Sacramento the influence of the sea breeze is sometimes wanting, and then the weather is oppressively hot; but Sonoma valley, while far enough off from the ocean to escape the fogs and cold blasts which prevail

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at San Francisco, enjoys just enough of the sea breeze to temper the heat of every summer day to the right standard for comfort.

As with the general course of water in a river, there are many abrading surfaces, irregularities, etc., which produce a thousand eddies in the main stream, yet, nevertheless, the general direction of the whole is not disturbed nor affected by those counter-currents, so does it appear to be with the oceanic winds in these regions. We have only to observe further, that the east side of any of these coast valleys will be commonly much warmer than the west; for, paradoxical as it may appear, the sea wind always blows much harder on the side of a mountain opposite or away from the wind, than it does on the side towards it. The reason of this is that the cold wind of the ocean being once lifted over the sea wall mountains, and being specifically heavier than the atmosphere into which it is driven, no sooner passes the summit, than it pitches down as a cold cataract, with the uniformly accelerated motion of falling bodies. A remarkable instance of the great contrasts of climate at short distances is found between Benicia and Martinez. These two places are only a mile and a half apart on opposite sides of the Straits of Carquinez, which connect the Bay of San Francisco with the Bay of San Pablo. The sea wind, rushing through the Golden Gate, sweeps along the Contra Costa, or second range, full in the face of Benicia, while at Martinez, close under the end of the mountain, which has turned the wind directly by, all the characters of the climate of the Sacramento valley, whose rim, it may be said, is here, are found to obtain.

"Equally plain, now," says an intelligent traveller,[1] "is the solution of those apparent inversions of latitude, which at first perplex the stranger. In the region about Marysville, for example, he is overtaken by a fierce sweltering heat in April, and scarcely hears, perhaps, in the travel of a day, a single bird sing as if meaning it for a song. He descends by steamer to San Francisco, and thence to San José, making a distance in all of more than two hundred miles, where he finds a cool, spring-like freshness in the air, and hears the birds screaming with song even more vehemently than in New England. It is as if he had passed out of a tropical into a temperate climate, when, in fact, he is due south of Marysville by the whole distance passed over. But the mystery is all removed

[1] Horace Bushnell, D.D., to whose philosophical account of the climate of California we here acknowledge ourselves much indebted.

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by the discovery that, instead of keeping in the great valley, he broke out of it through the Straits of Carquinez into the bay valley and the cold-bath atmosphere of the coastwise mountains, that now he is in fact within twenty miles of the sea, separated from it only by a single wall, while at Marysville he was more than a hundred miles from the sea, with four or five high mountain tiers between."

To proceed with our type of the coast climates: San Francisco, which is on the same parallel with Washington and St. Louis, has neither the cold winters nor the hot summers of the latter places; and this is true also of the entire coast between 35 and 40 degrees of latitude. In the tabulated series of thermometric monthly means it can be readily computed that the mean temperatures of spring, summer, autumn, and winter, at San Francisco are 55°, 59°, 58°, and 50°, respectively; showing a difference of only nine degrees between the average of winter and summer — whereas a similar comparison of the temperature on the same parallels of the Atlantic coast shows a difference of between 35° and 40°. There is a range of three degrees more in San Francisco by taking the months separately: January, the coldest month, having a mean temperature of 49°.9, and September, the warmest, a mean of 61°.1. October is warmer than July and August, being 59°.5, 58°.8, and 59°.3, respectively; while the mean temperature of the year is 55°.9. The lowest point to which the thermometer has ever fallen was 22° in January, 1862; while in St. Louis, it descends to 12° every winter, and frequently remains near that figure for many consecutive days. The coldest winter days, at noon, are as warm as the warmest in Philadelphia. On the other hand, the summers are comparatively quite cool. In November, 1854, the lowest reading of the thermometer was 47°, while in July of the same year it was 46°. Showing that at no time of the former month was it so cold as at one time in the latter. The mean temperature of July is 57°, and there are not more than a dozen days in the year when the thermometer rises above 80°. The average range of the thermometer in July and August, is about 20°—from 50° to 70°. Once only the thermometer rose to 97°, and as it often falls to 46° in July, such a range of 41° might occur within 12 hours. No matter, however, how warm the day is, the evenings and mornings are always cool; and this is generally the case throughout the whole State. On an average, in California, the atmosphere remains free from clouds for two-thirds of the year, but near the sea-coast, clouds

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are frequently blown up from the ocean. In June, July, and August, heavy, wet, cold mists come up to San Francisco, from the sea at six o'clock in the evening, and continue until eight or nine next morning. In the winter, fogs are rarer, and do not commence so early in the evenings. Writing of the fogs and mists at San Francisco, Dr. Henry Gibbons, says:[1]—

"It is curious to observe the conflict between the absorbing power of the air and the supplying power of the ocean, in regard to moisture. Towards noon, when the wind rises, huge columns of mist may be seen piled along the coast, three or four miles west of the city, and pouring in like a deluge upon the land. But the air of the land, which is always thirsty, drinks it up with astonishing avidity, so that the impending wave, though in a current moving from thirty to fifty miles an hour, makes slow progress. By the middle of the afternoon it is within a mile or two of the city, and there it stands like a solid mass of water several hundred feet in depth, rolling and tumbling towards you, not without grandeur and majesty, and threatening to overwhelm you in a few seconds. You await its coming, but it comes not; it even recedes, to return and recede again. Not until the sun has lost his calorific power does the atmosphere reach the point of saturation; and then, towards sunset or later, everything is submerged by the vapory flood. In the course of the evening the wind falls. During the night the mist is gradually dissolved and disappears from the lower stratum of air, while it forms a heavy cloud above. About the middle of the forenoon the cloud is dispersed by the rays of the sun. The dispersion is rapid, the sky often becoming entirely clear in less than half an hour.

"If it be possible to distinguish between fog and mist, regarding the former as impalpable, and the latter as composed of palpable particles of moisture, I may remark that mist belongs only to the summer, and fog to the winter climate of San Francisco. There is no mist in winter, and no fog in summer. At all seasons the drying tendency of the atmosphere is observable. You notice none of those phenomena which in other climates depend on an excess of water in the air, and on sudden changes of temperature. The moisture does not condense on your windows, nor on the plastered walls; salt does not liquefy, nor even exhibit the slightest dampness; and the housewife has no trouble in drying her clothes,

[1] Transactions of the 3d Session of the Medical Society of the State of California.

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provided it should not rain. In fact, the atmosphere of San Francisco, in spite of sea winds and mists, is a dry atmosphere."

The general course of the coast of California is, going southward, from N. N. W. to S. S. E.; but at lat. 35° it turns due south, and, after keeping that direction for forty miles, makes a right angle and runs due east eighty miles. Along the southern side of this angle runs a high mountainous spur, which, projecting into the ocean at Point Conception, seems to protect the coast south of it from the fogs, which are much warmer and rarer in this direction. The summers too are much warmer than on the coast to the northward of it, but the sea-breezes are regularly felt, as shown in the thermometric table for San Diego, and they protect the whole country to a distance of fifty or sixty miles from the ocean against the excessive heat which reigns in the Colorado Desert. The winters, however, are nearly as cold as on the coast further north. Los Angeles, in lat. 34°, is at times as cold in winter as San Francisco in lat. 37° 48′, because it is farther from the ocean and is in sight of Mt. San Bernardino and other high mountains, some of which are capped with snow during a great part of the year. In the tabulated thermometric series it will be perceived how the cold oceanic current attempers the summer climate over a great extent of coast, while the extremes of summer heat are common to all the valleys, where the mountain ranges intervene between them and the Pacific. Blodgett states that the isothermal of 57° is found to extend along the coast from Sitka, in Russian America, to Monterey, giving an almost absolutely equal temperature for this extensive line of 1500 miles of latitude and near 2000 miles of coast.

A brief period of observations on the coast of Oregon shows the temperature higher; which, if substantiated, may prove the position of the cold line to be a little distance off that coast at sea:—

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TABULATED SERIES OF THERMOMETRIC MONTHLY MEANS WITH THE VARIATIONS THEREFROM.

Sacramento, for 9 Years, 1856–'64.

The results of the observations at this station afford an approximate standard for estimating the climate of the immense Sacramento and San Joaquin valleys, which may be called a single valley, the meteoric condition of which varies as little as its geographical formation. The exposure is locally over low plains, with much surface water, in the centre of the wide interior valley.

Months.	7 A. M.	2 P. M.	9 P. M.	Mean.
January	—3°.8	+3°.6	+0°.2	46°.9
February	—5.0	+4.5	+0.5	50.4
March	—5.0	+5.0	—0.1 / +0.1	55.0
April	—4.9	+5.5	—0.6	59.8
May	—4.0	+5.8	—1.8	64.0
June	—4.6	+6.6	—2.0	69.7
July	—5.0	+7.0	—2.0	72.9
August	—5.4	+6.9	—1.5	71.3
September	—6.8	+7.3	—0.5	68.6
October	—6.7	+6.9	—0.3 / +0.1	61.8
November	—5.8	+5.7	—0.2 / +0.3	53.3
December	—3.8	+3.8	—0.2 / +0.2	46.9
Sums	—60.8	+68.6	+1.4 / —9.2	720.6
Means	—5.0	+5.7	+0.1 / —0.8	60.05

San Diego, for 1 Year.

This station is situated at the head of a valley six miles northeast from the old Presidio, and eight miles from the sea-shore; latitude 32° 42′; longitude 117° 14′; altitude 150 feet. The valley opens upon the plain extending to the town and shore hills, of 250 feet elevation, bordering the valley and a range of mountains lying about fifteen miles east. Position from Lieut. Williamson's survey map, 1855, based on Boundary Commission and Coast Survey positions for San Diego.

As shown on the draft of the curve the means for March and April seem erratic.

Months.	7 A. M.	2 P. M.	9 P. M.	Mean.
January	—6°.4	+7°.1	—0°.8	50°.6
February	—5.7	+7.0	—0.3	53.3
March	—4.2	+7.1	—2.9	58.3
April	—3.3	+5.5	—3.1	56.0
May	—1.4	+4.7	—3.3	60.2
June	—2.2	+5.3	—3.0	65.0
July	—2.1	+5.5	—3.3	67.6
August	—1.5	+4.7	—3.3	66.5
September	—2.3	+5.3	—3.1	65.0
October	—2.2	+4.9	—2.6	63.9
November	—4.0	+6.1	—2.0	58.2
December	—6.5	+8.4	—2.2	53.3
Sums	41.8	71.8	29.9	717.9
Means	—3.5	+6.0	—2.5	59.8

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San Francisco, for 9 *Years*, 1855–'63.

As Sacramento is the type of the climates of the interior valley regions, so does San Francisco bear the same relation to the entire coast of California from Oregon to San Diego. Although six miles from the ocean, the sea wind blows into the bay, in which it is situated, through the gap at the Golden Gate, like through a funnel, with increased intensity. As shown in the curve, the temperature during July and August is abnormally low on account of the fogs which prevail during that period in excess.

Months.	7 A. M.	2 P. M.	9 P. M.	Mean.
January	—3°.2	+3°.7	—0°.5	49°.9
February	—3.8	+5.2	—1.4	52.1
March	—3.9	+5.9	—2.1	54.0
April	—3.2	+6.4	—3.1	55.8
May	—2.6	+6.4	—3.8	57.0
June	—2.7	+6.9	—4.3	59.0
July	—2.8	+6.7	—3.9	58.8
August	—3.3	+7.1	—3.8	59.3
September	—3.5	+7.8	—3.4	61.1
October	—4.0	+6.3	—2.4	59.5
November	—3.5	+4.7	—1.2	54.8
December	—2.8	+3.5	—0.7	50.2
Sums	—39.6	+69.6	—30.0	670.8
Means	—3.3	+5.8	—2.5	55.9

Astoria, for 18 *Months, July*, 1859, *to December*, 1860.

The station is at the town of Astoria, Oregon; latitude 40° 11′; longitude 123° 48′; altitude 50 feet, on the south bank of the Columbia River, ten miles in a direct line from the Pacific. The locality has a free exposure over water surface and low plains to the sea, with rough hills at the south and east. Position from United States Coast Survey, 1853. Although the effect of the cold sea winds is strikingly shown at the 2 P. M. observations, still the difference between the hot and cold part of the day is seen to be much less than in the stations further south.

Months.	7 A. M.	2 P. M.	9 P. M.	Mean.
January	+1°.5	—1°.3	—0°.3	41°.3
February	+2.2	—2.9	+0.6	43.3
March	+3.9	—4.4	+0.5	45.3
April	+2.4	—4.0	+1.5	46.8
May	+2 4	—3.6	+1.1	51.7
June	+1.9	—3 3	+1.5	56.5
July	+2.1	—3.5	+1.4	59.2
August	+2.4	—3.9	+1.5	61.6
September	+2.7	—3.8	+1.2	58.9
October	+2.6	—3.3	+0.8	53.7
November	+1.9	—2.4	+0.5	44 3
December	+1.9	—2.1	+0.2	39.5
Sums	+27.9	—38.5	+10.5	602.1
Means	+2.3	—3.2	+0.9	50.2

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CLIMATE OF THE SIERRA NEVADA REGION, &c.

In proceeding now to the consideration of the climatology of this division of our subject, it is necessary to premise that the instrumental data we possess are too limited to afford anything like positive deductions respecting so extensive a region. All that we can hope to accomplish is to describe in some general manner the various climatological distinctions, which we have already stated as existing between the different parts embraced under this general heading. There is one feature, however, of the distribution of the temperature, which is well established and positive, and that is the *great excess of heat for the altitude* of this region as a whole. According to Blodgett, the isothermals often continue their direction across the elevated region, without sensibly changing their position in latitude, as they approach it from the low plains at the east, or from the ocean on the west. But although the heat of summer at midday is almost as great as in the Sacramento valley, and even sometimes insupportable from the reverberation in deep cañons, it is nevertheless qualified by altitude and severely cold winters, while the amount of precipitation is greater in proportion to elevation. A gentle west wind, heated in the lower parts or foot-hills by the heat of the great valley, fans it all day. At points which are higher, the wind is cooler. The nights, too, are always quite cool in summer; so cool, that the late and early frosts in many districts leave too short a space for the ordinary summer crops to mature, even where the altitude is not more than 3000 to 4000 feet. At the summit of the sierra, the west wind, piling up from below, breaks over with accumulated force into Utah. "A traveller's tale" is, that it blows with such stress in some of the passes as even to polish the rocks by the gravel and sand which it drives before it. The day is cloudless on the slope of the sierra as in the valley, but on the summits there occur, sometimes, severe thunder showers. With this exception, thunder is very seldom heard in any part of California. The winters, as just stated, are very severe. In places 3000 feet above sea level, ice forms five or six inches thick, and snow, deep enough for sleighing, lies several weeks nearly every winter. In towns, 6000 feet above the sea, snow falls from five to ten and even fifteen feet deep, and covers the ground five or six months in the year.

The following means of the thermometer for the coldest and hottest months at different altitudes, kindly furnished by Major

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Williamson, U. S. A., afford the only positive knowledge of the climate of this section that we can obtain:—

Stations.	Altitude.	July.	January.	Range.
Aurora	7.468 feet	68°	26°	42°
Hope Valley	7.088 "	55	26	29
Strawberry Valley	5.710 "	60	36	24
Fort Jones	2.570 "	71	31	40

Aurora, the southernmost of these stations (lat. 38° 12′), has been found by the late boundary survey to be about three miles within the new State of Nevada. It is situated upon a beautiful flat formed by the conjunction of two ravines, which come down from between Silver, Middle, and Last Chance hills. The observations at Fort Jones, the northernmost station (lat. 41° 36′), are obtained from the *Army Meteorological Register*. It is situated in Scott's Valley, on a small tributary of the Klamath River, nearly one hundred miles from the head of the Sacramento valley, and an equal distance in a direct line from the Pacific coast. The locality is not closely confined, though it has high mountains, the Siskiyou and Salmon ranges, on the south and east.

The above remarks and measurements of temperature apply more particularly to the higher latitudinal portion of the Sierra Nevada range, including the elevated plateaus of the Klamath and Pitt River regions, etc. In the more southerly part of this remarkable mountain system, and especially below Mono Lake and the head-waters of the San Joaquin, quite a different order of climatic features present themselves. Here the general character of the vegetation has obtained for these mountains the title of "the Alps of California," but their homologue is rather found in the Arctic zone than in Switzerland. In the Swiss Alps, trees are not found more than 6,200 feet above the sea. According to *Johnston's Physical Atlas*, the pine, the larch, and the common fir cease at successive stages to the elevation of 5,900 feet; one of the Coniferæ only, the *Pinus lembræ* is observed sometimes to advance 300 feet further. In the Californian Alps, trees reach to 11,000 feet.

In an interesting account of Prof. Brewer's explorations, published in the *Mining and Scientific Press* for October, 1864, it appears that good pasturage reaches from 5,000 to 10,000 feet above sea level, and even higher, up to the very crests of the peaks. It consists in about equal shares of the true grasses and the sedge grasses, and is extremely nutritious. At 3,500 feet above sea level,

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the dense forest begins. The trees are mostly sugar and yellow pine, Douglass spruce, fir, and bastard cedar. Along the western slope, at an altitude of 5,000 to 7,000 feet, the "Big Trees," or giant *Sequoias*, are abundant, not merely occurring in isolated groves, as is the case further north, but scattered abundantly in common with the timber for a distance of at least twenty-five miles along the tributaries of Kings, Kaweah, and Kern Rivers. Larger trees are met with here than in the celebrated Calaveras and Mariposa groves. The largest reported is about forty feet in its greatest diameter.

Besides the arctic character of the vegetation just alluded to, it would seem that the entomology is so likewise. The red snow, also, peculiar to the arctic zone as well as to the European Alps, is also found. It is not snow, but little globules, intensely red in color, which are so abundant as to give a red tinge to a large mass of snow. M. Pouchet, in conducting some interesting investigations with regard to spontaneous generation, has found in snow collected on the top of Mount Blanc, at an altitude of 12,104 feet, specimens of the *Protococcas nivalis*. It is highly probable, therefore, that this redness of the snow is due to microscopic animalculæ.

Recurring now to the higher latitudinal portion of the mountain system under consideration, we find, on the eastern slope, that the new State of Nevada has its wet and dry season just like California, except an occasional interruption of the latter season by showers. Dr. Farley, already cited as authority, when describing the topography of this district, states that the winters are uncertain and variable, the thermometer often falling to ten and twelve degrees below zero, though it is not apt to remain at so low a point for more than a few days at a time. During the months of June, July, and August, the thermometer oscillates between 75 and 100 degrees. "The amount of stormy weather experienced is small compared with the Atlantic States or even California. Yet the snow upon the mountains falls to a great depth, especially upon the main sierra, where it often lies from fifteen to twenty feet deep, remaining until late in the months of May and June, and upon the north slope and some of the higher peaks all summer. In the valleys it rarely falls to a greater depth than one or two feet, and seldom lies more than a few weeks at a time. The further the valleys are removed from the Sierra Nevada range, the smaller the amount of snow and the shorter time it remains upon the ground. Some of the more sheltered valleys in the interior are nearly free from snow the year round, or, if it falls occasionally, it never accumulates

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beyond a few inches, and melts in a day or two. During the fall and winter months, the whole country is subject to violent winds, which at times blow with great fury, prostrating houses, fences, and trees.

"The changes in temperature during the fall and winter are frequent and violent, the thermometer varying as much as 40° in 24 hours. During the summer the heat is steady throughout the day, the nights generally being cool, and one enjoys a good night's rest often under winter bedding. The suffering here from heat is more intense than at the same temperature in the Eastern States, owing to the extreme aridity of the atmosphere and the great amount of fine silicious dust that is raised whenever the soil suffers the least disturbance. This dust, besides its extreme tenuity, is very irritating to the mucous membranes, and even the skin, owing to the amount of saline substances it contains.

"As I have remarked, there is an occasional shower during what is considered the dry season. They are much more frequent on the mountains than in the valleys, and are often attended with thunder and lightning. These electrical phenomena, not usual on the Pacific coast, are not continuous and frequent, consisting usually of a few vivid flashes of lightning and heavy peals of thunder, which seem sufficient to restore the electrical equilibrium. Frosts visit the valleys every month during the year, except, perhaps, July and August, and have been known even in these. They do not, however, seem to injure vegetation, unless it be the more tender plants. Nearly every kind of vegetables ripens in these valleys, if planted in season and properly cultivated."

Passing on next to the region of the Great Utah Basin we find that, as a whole, the general amelioration of the Pacific climates is here felt, in the fact of the mean temperature differing little from that of the Atlantic States in the same latitude, notwithstanding its elevation of 4500 to 7000 feet. It is as warm in the annual mean, states Blodgett, from whom we here condense, as the immediate coast of the Pacific. Nevertheless, the sum of conditions in the basin climates is in contrast with that of the Pacific district, as a whole, on several points. The distribution of rain is one of the most important. The succession of rains in spring and early summer is similar to that which prevails in the same latitudes in the Atlantic States. Showers are frequent and irregular, and there is no tendency to periodicity apparent for so much of the year. There is a feature of the rains of the summer at the close of June

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worthy of notice. It is the abruptness of the changes of temperature, and the violence of the winds, apparently the incident of the great elevation of the whole plain. The severe changes of temperature during these storms are noticed by Fremont, Stansbury, and Beckwith. The heat and rarefaction of the surface generally render the local atmosphere disproportionately arid over the whole basin region, notwithstanding the frequency of rains at all seasons.

"A very rapid evaporation is in progress apparently at all times, and it can hardly be otherwise, when, even in the early spring, the saline plains glitter with crystallizations—dissolved on one day, perhaps, by the rain, yet formed again almost immediately by its evaporation. Very few of the localities have external drainage, or unite their surplus waters with any stream or lake; and as the rains are frequent at some points, and for some parts of the year, this is," says Blodgett, from whom we here quote, "conclusive evidence that the evaporation is very rapid. The latitude and altitude place much of the country at the border of the *periodical* climates, and where the facts of rain-fall and temperature-range conform to the *equally distributed* division, while the resulting effect upon cultivation conforms to the *periodical* class of climates. At the southern border the tropical features are intruded from the north of Mexico; and the summer rainy season, which gives profuse moisture at a little distance south of the Gila River, is intruded into the Great Basin as a *tendency*, which may attain to profuse rains, or may pass without any."

The Colorado Desert is noted for its excessive temperature and absence of rain. But although the summer days are exceedingly hot, and the winters warm, occasional frosts occur in the spring and fall as well as in the winter. Fort Yuma, situated on the west bank of the Colorado, opposite the mouth of the Rio Gila, at the altitude of 120 feet, affords an approximative idea of the climate of this portion of California. If in the valley of the Colorado, which averages seven miles in width, and is bounded by rocky mountains and sand hills on either side, which separate it from the surrounding desert, the heat is so excessive, what must it be in the desert itself? The mean annual amount of rain at this post is only 3.24 inches.

Of the temperature, Surgeon H. R. Wirtz, U. S. A., wrote to the Surgeon-General in June, 1856, that in June and July it frequently reaches 124° Fahrenheit. The latest monthly register for July from the same source reads as follows: Mean for the month

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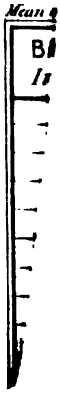

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at 7 A. M., 88°. 80; at 2 P. M., 108°. 12; at 9 P. M., 91°.09. Average daily mean for the month 95°. 36; maximum 116°; minimum 80.° July is usually the hottest month. According to the *U. S. A. Meteorological Register*, December is the coldest month, the mean temperature being 57°.10.

GENERAL RESUME OF CLIMATOLOGY.

One of the elements of climatic topography, which remains to be noticed, is that of the barometric pressure—a force not physiologically appreciable except at great heights. Major R. S. Williamson, of the U. S. Corps of Topographical Engineers, has for some years past been engaged in making observations on the hourly fluctuations of the barometer at the level of the sea and at several points on mountain stations, with the view of determining the exact correction in measuring heights, as well as other questions of great scientific interest. To this gentleman we are indebted for several results of meteorological observations in different regions of the State, which appear in our tables.

The following table, showing the contrasted results of a series of barometric observations made at or near the level of the sea and on the summits of our mountains, will give some idea of the fluctuations of the atmospheric pressure.

Stations.	Altitude.	Length of time obs'd.	Means.	Mean max.	Mean min.	Range.
San Francisco . .	22 ft 0 in.	1856–'63	30.052	30.231	29.900	0.331 in.
Sacramento . . .	54 " 5 "	1856–'64	29.989	30.225	29.722	0.503 "
Aurora	7468 " 0 "	10 mos.	22.990	23.047	22.934	0.113 "
Hope Valley . .	7088 " 0 "	4 "	23.280	23.286	23.275	0.011 "
Strawberry Valley	5710 " 0 "	3 "	24.486	24.500	24.473	0.027 "

The slight variations in the pressure of the atmosphere and the absence of either abrupt or great change, better shown in the following table of successive hourly ranges at Sacramento, give indication of the tropical feature which the climate possesses. The free movement of the aerial mass, if that agency can be supposed to affect this result, is interrupted by the frequent ranges of mountains; or rather, as Blodgett assumes, the accumulated heat and moisture cannot become so great as in corresponding latitudes on the Atlantic coast and elsewhere, where the movements of the mercury are sudden and less restricted, perhaps for want of the volume of lower atmosphere; and therefore the disturbance caused by the

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removal of the excess and the restoration of the equilibrium cannot become great and general. The subjoined table, calculated from the horary observations taken once a month by us, at Sacramento, during 1857, gives the mean successive hourly range for the year. The signs + and — denote the range of each hour above or below the mean of 24 hours.

Table of Successive Hourly Ranges of Barometer.

Hours.	Jan. 22d.	Feb. 23d.	Mar. 22d.	April 29th.	May 22d.	June 22d.	July 21st.	Aug. 25th.	Sept. 23d.	Oct. 21st.	Nov. 27th.	Dec. 23d.	Mean.
7 A. M.	+.044	+.134	—.064	+.098	—.008	+.052	+.028	—.024	+.057	+.080	+.056	+.117	
8 "	+.041	+.125	—.057	+.098	—.016	+.042	+.036	—.024	+.061	+.095	+.044	+.117	
9 "	+.041	+.114	—.032	+.103	—.012	+.038	+.042	—.032	+.075	+.092	+.053	+.122	
10 "	+.036	+.081	—.026	+.101	—.008	+.048	+.044	—.014	+.076	+.084	+.065	+.127	
11 "	+.031	+.058	—.018	+.083	—.010	+.048	+.039	—.002	+.067	+.079	+.038	+.107	
12 M.	+.028	+.028	—.043	+.053	—.040	+.041	+.037	—.017	+.052	+.062	+.025	+.078	
1 P. M.	+.015	+.024	—.049	+.031	—.037	+.018	+.020	—.018	+.031	+.037	+.014	+.047	
2 "	—.029	+.018	—.046	—.010	—.040	+.014	—.008	—.038	+.009	+.008	+.006	+.029	
3 "	—.033	+.012	—.046	—.029	—.052	—.007	—.014	—.038	—.007	.000	+.004	+.004	
4 "	—.053	—.005	—.043	—.047	—.059	—.019	—.012	—.046	—.025	—.024	+.006	—.002	
5 "	—.029	—.005	—.040	—.135	—.056	—.031	—.031	—.050	—.032	—.030	—.003	—.017	
6 "	—.031	—.010	—.008	—.054	—.035	—.019	—.046	—.056	—.032	—.030	+.013	—.021	
7 "	—.028	—.007	—.040	—.060	—.026	—.046	—.038	—.033	—.053	—.018	+.016	—.027	
8 "	—.028	—.006	—.008	—.048	—.024	—.038	—.017	—.018	—.035	—.039	+.002	—.036	
9 "	—.023	—.022	+.015	—.040	+.002	—.037	—.010	—.005	—.024	—.036	+.004	+.037	
10 "	—.047	—.022	+.040	—.019	+.040	—.027	—.010	+.030	—.022	—.045	—.005	—.039	
11 "	+.002	—.042	+.046	—.011	+.043	—.016	—.007	+.023	—.019	—.038	—.005	—.042	
12 "	+.002	—.042	+.032	—.030	+.045	+.012	—.009	+.026	—.021	—.032	—.009	—.051	
1 A. M.	+.005	—.051	+.057	—.027	+.048	+.015	—.012	+.028	—.016	—.030	—.019	—.064	
2 "	+.005	—.033	+.064	—.025	+.051	+.007	—.013	+.031	—.013	—.034	—.032	—.066	
3 "	+.010	—.062	+.067	—.022	+.053	—.005	—.013	+.030	—.020	—.040	—.046	—.074	
4 "	+.013	—.083	+.072	—.019	+.051	—.012	—.011	+.065	—.033	—.035	—.066	—.074	
5 "	+.015	—.087	+.072	—.019	+.043	—.024	—.019	+.086	—.045	—.052	—.086	—.091	
6 "	+.013	—.097	+.073	—.022	+.034	—.028	.000	+.108	—.026	—.046	—.086	—.106	
Sums	600	1186	1078	1084	833	664	516	842	853	1066	703	1495	
Means	.025	.049	.045	.045	.035	.028	.022	.035	.030	.044	.029	.062	.038

The mean successive daily range frequently in summer does not amount to more than the $\frac{94}{1000}$ part of an inch. The mean difference of the successive months, above or below the annual average, is not more than $\frac{1}{11}$ of an inch. Between the highest mensual mean, and the lowest, a fraction over $\frac{1}{4}$ of an inch is found. The extreme ranges observed during the month are also limited. In the barometric curve the evidence of some regular moving influence is plainly revealed in the annual tide—gradually descending as the sun approaches the northern tropic, and ascending as it returns towards the southern. The extreme annual ranges are also small. In some of our former publications we stated a minimum, which was observed in December, 1853, of 28.980 inches—giving a difference from the maximum of the same year of 1.460 inch. This, however, may be attributable to a defective instrument, as we have never since made so low a reading. A more reliable, and the next lowest minimum was 29.380 inches, observed with Guy

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Lussac's siphon barometer, on the morning of the 1st of January, 1855, during a strong gale from the southeast. The greatest mensual range was also observed in the same month—the maximum for the year having reached 30.410 inches in the same month, and giving a difference of 1.030 inch for the month as well as for the year. These instances of extreme range we regard as exceptional, and therefore they do not enter into our computations, which commence from January, 1856, the date of our first using the Smithsonian barometer. Since this time the highest reading was on the 19th of December, 1856, viz., 30.619, and the lowest on the 26th of January, 1865, viz., 29.497; the extreme range, therefore, is 1.122 inch. During the rainy season, northerly winds always determine the greatest elevation, and southerly, the greatest depression of the mercurial column. This rule is not so constant during the dry season.

In review of the distinctions of a general character belonging to the climate of the different regions of California just discussed, they may be briefly summed up, in the words of Blodgett, as being, "*Aridity* first; *isolation* of districts and conditions next; and thirdly, *periodicity* of rains, winds, and some other prevailing phenomena, in distinction from equally *distributed* rains, etc., as in the Eastern States. The *isolation* of phenomena implies an interruption of the symmetry so characteristic of the East, and all the important differences which follow in this train. Extreme contrasts, diversities, and transitions belong here to place or locality, and in the East to *time*."

The leading distinction of aridity is clearly shown in the table by the rain-distribution, and though there are exceptions to the rule that atmospheric humidity is fairly indicated by the quantity of rain, they do not apply to any point here except the immediate coast of California. There the low peculiar summer temperature is almost constantly attended by fogs and mists, but there is no parallel to this phenomenon in the interior, or beyond a very narrow line of coast. In the mountainous districts the illustration is, on the other hand, in excess of a fair representation of the humidity, as the rains are local and profuse while falling, occupying little time or space, and succeeded at once by the otherwise constant aridity of the air.

Excepting temperature, there are, perhaps, no conditions of the air more important to be studied, in a medical point of view, than those dependent on the presence of aqueous vapor. It is the ab-

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sence of what has been supposed to be a prolific source of pestilence, viz., a high dew-point with a high temperature, that constitutes the hygienic element of the Pacific climates—so far as the present state of science warrants such conclusion; and as a knowledge of the causes of this dryness of the atmosphere, especially during the summer months (see table of Relative Humidity), is essential to a proper conception of its medical constitution, we here present the following philosophical and simple account of the distribution of moisture in California, from the U. S. Agricultural Report for 1862. It is necessary to premise that, during the winter, when it rains, the winds invariably blow from the south and southeast; and when it is dry, from the north and northwest. In the summer the former are the moist refreshing equalizers of the climate, while the latter, which are highly charged with positive electricity, are hot, dry, and blighting to vegetable as well as animal life. The northwest wind is dry, because in passing from the equator to the pole it has parted with all the moisture it had absorbed, when rising into the upper regions of the atmosphere at the equator.

During the season of 1863–4, which was one of drought in California, the northwest winds were always greatly in excess of the average. Why it was so, meteorology cannot at present furnish a satisfactory explanation; but why the winds of the wet season in California are from the southeast instead of from the southwest, as in the eastern part of the continent, conformably with the following theory, is easily explained. East winds are mere surface winds, caused by an approaching fall of rain and snow, or condensation. They prevail in the east as well as here in the winter. But the rain comes from the higher strata of clouds, which are moving from the S. W. to the N. W. Now we have seen that our mountain ranges run from the S. E. to the N. W.; these deflect the S. W. winds from their natural direction towards the N. W., or from the S. E. Hence, the eastern winds, caused by rains, would naturally unite with the deflected S. W. winds, and aid their deflection.

With this understanding of the subject, we conclude with the following statement, just referred to, respecting the machinery employed by nature for the distribution of moisture in California:—

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Force of Vapor. Monthly and Annual Means for Eight Years at Sacramento.

Y'rs.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Means
	inches	inches	inches	inches	inches	inches	inches	inches	inches	inches	inches	inches	inches
1857	.295	.297	.347	.421	.427	.500	.474	.454	.415	.352	.286	.253	.377
1858	.238	.303	.301	.344	.366	.413	.433	.456	.401	.328	.306	.222	.343
1859	.231	.289	.257	.321	.363	.503	.469	.451	.410	.367	.347	.230	.353
1860	.262	.258	.316	.342	.358	.421	.476	.478	.411	.372	.266	.283	.354
1861	.257	.307	.340	.382	.397	.434	.501	.457	.464	.330	.312	.322	.375
1862	.278	.273	.298	.286	.333	.436	.485	.451	.412	.391	.270	.221	.345
1863	.248	.248	.305	.340	.387	.400	.480	.434	.441	.312	.234	.258	.338
1864	.275	.282	.298	.353	.397	.406	.403	.440	.392	.336	.264	.315	.347
Sums	2.084	2.257	2.462	2.789	3.028	3.513	3.721	3.621	3.346	2.788	2.285	2.104	2.832
Means	.260	.282	.308	.348	.378	.447	.465	.452	.418	.348	.285	.263	.354

Relative Humidity. Monthly and Annual Means for Eight Years at Sacramento.

Years.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Means
	per ct	per ct	per ct.	per ct.	per ct.	per ct	per ct.	per ct.	per ct.	per ct.	per ct.	per ct.	per ct.
1857	85.24	78.07	75.68	74.92	70.22	64.14	60.62	63 79	58.68	67.84	72.21	79.88	70.10
1858	79.57	76 52	72.95	67 30	61.48	59.57	60.05	62.81	59.01	65.18	73.58	74.98	67.75
1859	78.05	78.73	68.32	68.90	64.81	59.51	66.95	65.63	65 61	64 41	82 32	80.30	70.55
1860	82.86	72.10	76 90	71.97	72.65	67.13	64.00	58.89	61.91	72.76	65.34	78 89	70.45
1861	78.37	77.93	75.30	72.03	67.47	67.49	60.94	63.35	68.68	64.27	74.67	85.00	71.28
1862	84.32	81.57	72 22	59.47	62.55	59.30	53.50	53.33	55.83	62.11	63.00	70 03	64.77
1863	75.69	72.68	67.24	66.18	58.06	55.74	54.52	58.33	60.33	56.00	60.05	77 03	63.65
1864	78 26	68.69	64.58	60.50	58.67	54.60	49.75	52.18	55.96	57.25	84.73	84.87	64.18
Sums.	642.36	606 29	573.29	541.27	515.83	487.39	470.33	481.36	486.01	509.82	575.90	630.98	542.57
Means.	80.29	75.79	71.66	67.66	64.48	60.92	58.79	60.17	60.75	63.73	71.98	77.62	67.82

"On each side of the equator, when the sun is vertically above it, and reaching to about the fifteenth degree of latitude on each side of it, and moving with the sun as it travels north and south of the equator, is a belt of dry surface winds encircling the earth, and blowing with a uniform and gentle force into the equator The wind of the north belt blows from the northeast; that of the south belt from the southeast. As these surface winds approach each other they rise, being expanded by the intense heat of the vertical sun, and become upper currents. The surface or lower currents are called the trade-winds; the upper, the counter trade. Mr. Maury and Mr. Butler maintain that the south belt of trade-wind, when it rises, becomes the northern counter trade or upper current, and the north belt of trade-wind becomes the southern upper counter trade. These currents pass through each other in strata, which may be represented by passing the fingers of the

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hands between each other. But the generally received opinion is, that these surface currents strike against each other as they ascend, and turn each other back over the hemispheres from which they came. I regard the first opinion as more philosophical, because currents of air more readily stratify than repel each other; and because the southern hemisphere of the earth is chiefly water, the immense evaporations of which are more needed to water the land hemisphere of the north than to be discharged on the ocean, where they are not needed. 'Nothing has been formed without a purpose.'

"Between the points from which these opposing surface belts of wind begin to rise there is a belt of rains also encircling the earth, and about five hundred miles wide. It is called the rainy belt, and from it pour down those torrents of rain which fall on Central America.

"As these dry surface trade-winds pass over the land and the ocean they absorb immense quantities of moisture, and their capacity to hold it is increased by the great heat imparted to them from the rays of the vertical sun. After they have risen, and become the upper or counter trade, the north one passes, at first, in a northern direction; but on account of the diurnal rotation of the earth it is gradually turned to the east, forming the southwest wind, so general during summer in the Atlantic States. As it passes northwards into a colder atmosphere it loses its heat; the moisture, in consequence, condenses, and at about fifteen degrees north of the equator, portions of the wind and moisture descend to the earth. Other portions having received the latent heat, liberated from the moisture that has descended as rain, continue northwards even to the north pole. The portions of the earth receiving these rains are called the extra-tropical rainy regions.

"The central rainy belt and these two belts of dry trade-winds follow the sun in its passage north of the equator to the tropic of Cancer, nearly to the twenty-fourth degree of latitude. As the northern edge of the dry trade-winds reaches fifteen degrees north of the latitude of the sun, when the latter is at the tropic of Cancer, this northern edge reaches to about the thirty-ninth degree of latitude, being within three degrees of the northern boundary line of California. But, before the sun reaches the tropic of Cancer, and after it begins to recede from it, northern California receives the rains that fall beyond the dry trade-winds. Thus, this part of the

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State receives more rain than the southern portion, which is longer covered by the trade-winds."

Besides the periodicity of the winds and rains, the limited oscillations of the barometer, and the general small range of the thermometer, there is still another indication of the tropical features of the climate of California to be noticed in the clear and cloudless sky. In a series of twelve years' observations at Sacramento, we find that, on an average, there are 197⅓ days in the year in which no clouds whatever are visible. The sky, during the greater part of this period, presents the deep blue of that of Italy, and so transparent is the atmosphere, that the summits of the Sierra Nevada range can be seen at Sacramento, a distance of 100 to 150 miles, as distinctly as if they were only a mile or two distant. This atmospheric characteristic does not always obtain, however, at least in the valley. During some of the hottest, and, as far as the lower strata of air are concerned, dryest days of the summer months, there is observable a vapory condition of the atmosphere, obscuring to a considerable degree the natural color of the heavens. This condition is much less frequently observed when the wind is blowing fresh, especially from the northwest. These facts, however, as has just been stated, can only be regarded in the light merely of *indications* of the tropical tendency of the climate; for, in the aggregate of its constituents, it has more of a temperate than a tropical character. This conclusion, to which we have arrived from the simple interpretation of figures and meteorological details, is fully confirmed from what has been observed respecting the physical influence of the climate, its effects upon the physical system of its inhabitants, considered in a distinct aspect from its morbific tendency.

Every one who remembers the gayness and lightness of spirit which a bright, sunny day produces after a period of cloudiness, is prepared to admit that light must exercise an important influence on the functions of the animal economy. Had we no other reason we should be authorized in inferring that that, which is so potent on vegetable life, stimulating the flower to expand its petals and welcome the vivifying agency with its fragrant embrace, is, also, though perhaps more obscurely, a stimulus to man. The physiology of the two kingdoms has always been found to be more or less closely related; and in the relations referred to, especially, proofs are not wanting. Deprive the tadpole of the influence of

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light and nourish it as we will, it remains a tadpole still.[1] Further development is arrested. So if we attempt to rear the tender human plant in well-curtained drawing-rooms, or ill-lighted and ill-ventilated manufactories or school-houses, instead of the development of healthy, we have that of tuberculous and other heterologous growths.

It may be a question, if, in California, the excess, or rather the long continuance of clear, sunshiny days does not act too potently as a stimulus, intensifying all the vital actions to a degree of exaltation often ending in collapse. With the *corpore sano*, the *mens sana* is certainly not always associated, as the crowded condition of our lunatic asylum unfortunately attests. Nevertheless, we incline to the opinion that this result of super-excitation is not so much to be attributed to the cheering sunshine and invigorating climate, as to man's abuse of his limited powers, and to that restless spirit of aggrandizement which is permitted to spread its dark and noisome cloud over the bright mental atmosphere which always attends the bright physical one.

With nothing to bias our minds in this view of the subject, the register of observations, as we have just stated, being our climatological bearing, we are pleased to add that we are fully sustained by a competent observer, Dr. F. W. Hatch, whose remarks in this connection we here quote from the *New York Journal of Medicine*, for July, 1855:—

"We shall not stop to discuss the question of the influence of the climate upon the development of man, as an organized being, though there are many substantial reasons, drawn alike from analogy and from direct and positive demonstrations, upon which the proposition of its superiority, in this respect, may be successfully maintained. Indeed, it may be remarked, that nowhere is there exhibited in the physical development of the animal organizations of a country, a more conclusive evidence of the directly modifying tendency of its climate, than is displayed among some of the animal races in California. The vigor, the energy, the physical amelioration which ensue upon their introduction into the State, can only be referred to this agency, and their thorough appreciation must lead, with all the weight of a sound analogy, to the substantiation of the principle to which we allude. The view of the climate which we intended, more especially, to illustrate, is

[1] Milne Edwards in Ward on Close Cases, p. 112.

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that of the resiliency, the elasticity it imparts to the system under the inroads of severe disease, or the shock of local violence—the recuperative energy displayed under circumstances the most inauspicious and discouraging. During a residence of nearly four years, numerous instances, illustrative of this climatic tendency, have occurred, and we regard it as one of the most remarkable, felicitous, and interesting expressions by which it is distinguished. Allusion has already been made to the remarkable exemption from disease exhibited by our inhabitants, under circumstances which, by all the processes of reasoning commonly adopted, would be expected to lead to a different result. In the earlier days of the settlement of the State, these modified influences were much more prevalent than at the present time; but, even now, they are to be seen every day, and serve as living evidences of the excellence of the climate—of the existence of the peculiar element of health under consideration. If we take, for example, the condition of some portions of this valley during the summer months, steaming beneath the rays of a burning sun, diffusing the rank vapors which arise from the depositions of an inundation over vast neighborhoods, or, as shown on a previous occasion, even of this city in the days of the annual floods, and observe the transient, the trifling, the very equivocal evils which ensue, we are at once furnished with a satisfactory illustration of the climatic principle to which we refer. But even more clearly is this principle displayed in the recuperative energy of the system under the destructive influences of disease or violence. No better evidence of this can be required than what may be fairly deduced from the following case:—

"A gentleman, of a naturally strong and vigorous constitution, was severely injured in a recent steamboat explosion at this port. Besides a large number of burns or scalds, denuding the cuticle from an extent of surface not less, in the aggregate, than five hundred square inches, upon his right leg was a compound comminuted fracture of both bones. The comminution was for an extent of about five or six inches of the tibia, and in some ten or twelve pieces. The protrusion of the bones was in two places, one each at the upper and lower extremities of the fracture. In fact, the tibia was completely crushed for the extent mentioned. In addition to the exfoliation of the cuticle by the scalds, the cutis vera and circumjacent cellular structures were entirely destroyed over a space not less than twelve or fifteen square inches. When the patient was found, after the accident, such was the vital depression,

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such the destruction of tissues around the fractured extremity, such the extent of nervous filaments exposed through the bare and denuded cutis, such the gloom, the mental depression, attending an accident so frightfully fatal in its consequences, that all reasonable probability militated against the saving the limb. If to these untoward prospects we add the profuse drain which was so soon to be established from so extensive a suppurating surface as that which the scalds had exposed, and the debilitation which must inevitably ensue, it must be admitted that the prognosis of an ultimate recovery with the integrity of the limb preserved, was scarcely to be entertained. Surgery—the science, the theory of surgery—here would have taught that amputation was almost inevitable. But an operation, postponed in deference to the wishes of the patient, at length became unneeded. Nature, taking the case into her own hands, almost unaided, save by the influence of the inherent efficacy, the recuperating impulse of a favorable climate, is repairing the injury in her own quiet way, and triumphs over the precepts of science and the sagacity of the surgeon.

"This is no isolated case. Its counterpart may frequently be met with in medical and surgical practice. Akin to the principle of organic development, of which we have already spoken, this constitutional element of the climate is equally pervasive, and is strongly exemplified by the most unmistakable evidences."

In order to afford a succinct and precise idea of the prominent features of the climate of California, the accompanying tables and curves have been prepared. The important points under consideration are thus reduced, in keeping with the spirit of the age, to quantitative description as far as the nature of the case admitted. Through this means, rather than by tedious commentary, we are the better enabled to demonstrate at a glance, intensities, amounts, and results, with an infinite saving of time, and, what is far more desirable, with numerical precision and truth. The tabulated series of thermometric monthly means, with the variations therefrom, at the hours of the three daily observations, give with their graphic representative the range of the temperature during the seasons of the year, and when viewed connectedly show the difference of the climate of the places whence they are derived. They also show the variations of the hour of the day. As observations at 2 P. M. give nearly the greatest temperature at that time during the month, and as the mean of the 7 A. M., 2 P. M., and 9 P. M. observations gives nearly the mean of the month, so when it is shown that the

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mean at 2 P. M. in a month, or a series of months, is + 5° 7′, it expresses the fact that the thermometer during twenty-four hours has a range of 5° 7′ above and below the mean. Many other facts of value may be gathered from these tables by those familiar with meteorological studies. In the comparative table the results of the annual and monthly averages of temperature for the whole period observed, together with the range derived from the mean maxima and mean minima, which are given, exhibit the difference of the temperature of the regions already passed under review. To facilitate the comparative estimate, the latitude, longitude, altitude, and mean annual amount of rain are also inserted. These contrasted summaries show how irregularly the isothermal localities in the State are distributed, and also how widely some of the districts we have grouped together are thermally separated from each other. It is also seen that while there are but few places in which the precipitation of aqueous vapor is approximately the same, there are many in which the difference is remarkably striking. These anomalies of temperature and rain distribution, while putting to fault the general law, that in temperate latitudes the atmospheric temperature is reduced one degree for every 333 feet of elevation above the sea, and that the quantity of rain diminishes in advancing from the equator to the poles, can by no means be construed into any manifestation of uniformity or correspondence between the ranges of temperature and quantities of rain at different elevations.

It must, however, after all, be conceded that apart from their scientific relations, it is very questionable whether the results arrived at have any direct value for medical purposes. To serve the ends of hygiene and the elucidation of the etiology of diseases, contemplated by reports like the present, every city, village, and settlement should have its meteorological record. We have endeavored to supply the deficiency by our general climatological description of the various regions passed under review; but, as has been made apparent, no two places, however inconsiderably distant, in a topographical point of view, even in the grouping we have employed, are to be found possessing the same mean temperature, not to speak of all the other meteorological phenomena that go to make up what is meant by climate.

It only remains for us now to hope that what we have accomplished may serve for a ground-plot, on which to raise a superstructure that will cover such a knowledge of topographical and meteorological conditions as shall disclose the true and intimate relations of health and disease to locality and climate.

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Comparative Table of Meteorological Stations in California.

Stations.	Altitude above the Sea, in Feet.	Latitude.	Longitude.	Length of Period Observed.	Temperature.				Rain and Snow in Inches.	Authority and Remarks.
					Hottest Mean Day.	Coldest Mean Day.	Range.	Mean.		
Fort Yuma	120	32° 43′	114° 36′	6 years.	92	56	36	74.00	3.24	Army Met. Register, 5 years partially.
San Diego	150	32° 42′	117° 14′	7 "	74	52	22	62.00	10.43	" " 3 " "
Monterey	140	36° 36′	121° 52′	6 "	59	50	09	55.00	12.20	" " 4 " "
Fort Miller	402	37° 00′	119° 40′	5 "	90	47	43	66.00	24.51	" " 4 " "
San Francisco	22	37° 48′	122° 27′	9 "	78	39	39	55.90	22.09	Williamson and W. O. Ayres, M. D.
Benicia	183	38° 08′	120° 14′	8 "	80	44	36	59.12	22.86	W. W. Hays, Surgeon U. S. A.
Stockton	35	37° 37′	121° 14′	4 "	72	56	16	62.00	15.10	R. K. Reid, Physician Lunatic Asylum.
Sacramento	54	38° 31′	121° 29′	12 "	94	32	62	60.06	18.23	Thomas M. Logan, M. D.
Marysville	76	39° 12′	121° 42′	1 "	90	38	52	63.32		W. C. Belcher, 1858.
Fort Reading	674	40° 31′	122° 05′	4 "	83	44	39	62.09	29.02	Army Met. Register, 2 years partially.
Aurora	7468	38° 19′	119° 00′	1 "	82	20	62	52.00		Major R. S. Williamson, U. S. A.
Hope Valley	7088	38° 47′	119° 54′	4 mos.	61	11	40	40.00		" " "
Strawberry Valley	5710	38° 49′	120° 07′	3 "	69	24	35	51.00		" " "
Fort Jones	2570	41° 36′	122° 52′	3 years.	71	31	40	51.40	16.77	Army Met. Register, 2 years partially.
Astoria	50	46° 11′	123° 48′	18 mos.	62	39	23	50.20	86.35	Blodget and Williamson, Jan. '59 to Dec. '60.
Fort Oxford	50	42° 44′	124° 29′	4 years.	61	46	15	53.62	71.63	Army Met. Register, partially.
Red Dog, Nevada Co.	2900	39° 13′	120° 47′	3 "					64.00	W. A. Begole, 1862, '3, '4.
Nevada	2630	39° 18′	120° 52′	1 "	72	45	27	55.75		John McCoy, County Assessor.

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EPIDEMICS.

The remainder of this report, comprising ninety-two pages of manuscript, is devoted to the consideration of Epidemics. The reporter arranges the diseases alluded to into three classes, namely, *Contagious* Epidemics, as Variola, Scarlatina, and Rubeola; *Infectious*, as Typhoid, Typhus, and Spotted Fevers; and *Meteoratious*, as Influenza and Diphtheria. The first nine pages are written by Dr. Logan, and relate chiefly to the prevalence of variola.

It is stated that wherever this disease has made its appearance among the Indian tribes, the native Mexicans, or the mixed races, whether of Mexico or California, it has generally proved exceedingly fatal. On the other hand, the Chinese in the latter State seem to manifest but little susceptibility to the disease. Among the American part of the population the disease has exhibited no phenomena or tendencies different from what have been observed in the Atlantic States. The only account given of its prevalence to such a degree as to merit the title of an epidemic, was in the winter and spring of 1861 and '62. During the first six months of 1862, there occurred in Sacramento about 270 cases, of whom 12 died. More than one-third of the whole number of cases were *varioloid*. Prompt vaccination and revaccination were found as efficient in limiting the spread of the disease, in that locality, as they have been elsewhere. The reporter gives nothing new in relation either to the pathology or the treatment of the disease.

Scarlet Fever and Measles.—The next twenty-four pages of the report are devoted to a consideration of the prevalence of scarlatina and rubeola, by F. W. Hatch, M. D., of Sacramento. Concerning the prevalence of scarlatina in that locality, Dr. Hatch writes: "Its first appearance seems to have been in 1856, commencing in July and continuing through December; the total mortality being only five. In April of the following year, and again in November, one death for each month was reported. From this time no traces of its fatal presence appear to have been seen until 1860. During this year its epidemic character was well marked from January until the close of the year, the highest monthly mortality being in May, June, and December; and the total deaths for the year, forty-eight. Admitting the population of the city to have been 14,000, we have one death in every 292 inhabitants, or 3.4 nearly in 1000. The entire mortality by all causes having been, in 1860, 425, excluding still births, we find the pro-

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portion by scarlatina alone to have been about eleven per cent. The next that was seen of it seems to have been in November, 1861, and from this date to February, 1862, with a total mortality of eight. In December, 1862, it reappeared, to terminate in January, 1863, with the very moderate record of only four deaths. In December of 1863, the disease seems to have assumed once more the similitude of an epidemic, raging more or less violently through the entire year following, and, as the records for January, 1865, show, even into that year; the total mortality from its commencement in December, 1863, to the close of January, 1865, having been twenty-seven, or about 0.19 in each 100 of population."

The report states that, during the same years here mentioned, this disease prevailed in many of the smaller towns in the Sacramento valley, and as far distant as the foot-hills of the Sierra Nevada. But no reliable statistics could be obtained relative thereto. From very imperfect records kept at San Francisco, it appears that both scarlet fever and measles prevailed in that city to a moderate extent in the years 1858, 1859, 1860, and 1863. Dr. Hatch states that throughout the Sacramento valley, in San Francisco, and in Oregon, in the years above named, the prevalence of scarlatina and measles was intimately associated with that of diphtheria; and that all these diseases prevailed most during the rainy or transition seasons of the years. Sufficient connection between the meteorological phenomena and the prevalence of these diseases is not shown to throw any additional light on the question of etiology. Neither does the report afford any new facts concerning their pathology and treatment.

METEORATIOUS EPIDEMICS.

Under this head is included another paper by Dr. Hatch, occupying thirty-eight pages of manuscript, on the subject of diphtheria. Of this disease, the first case was reported at Sacramento in 1854, from which time it continued to prevail to a very moderate extent up to the commencement of the present year. The total number of deaths attributed to the disease during the eleven years was 131, of which 41 occurred in 1860. The writer regards croup, when epidemic, and diphtheria as identical, and, to a limited degree, as contagious. The disease, as it prevailed in California, and described by Dr. Hatch, appears to have presented no features different from the descriptions found in all our medical works. Neither

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does his paper present any new or additional facts in regard to its causes, pathology, or treatment.

The remaining twenty pages of the report are written by Dr. Logan, and as they are, in some measure, corrective of opinions advanced in a previous report printed in the *Transactions* of this Association, it is deemed best to retain them in full.

N. S. DAVIS,
In behalf of Section on Meteorology, Epidemics, &c.

INFECTIOUS EPIDEMICS.

In accordance with the arrangement we have adopted, it would be in order to treat, under this head, of those zymotic or febrile diseases which, while their primitive cause is supposed to consist in malaria, are assumed to possess the property of propagating their like, by means of a vitiated or poisoned atmosphere emanating from and surrounding the diseased person, without contact of the body or clothing.

Of this class of diseases we have no special epidemic to report from California proper. This State, considered by itself, has been comparatively exempt, since our last report, from the prevalent forms of those febrile endemics peculiar to certain localities, the geological formation of which would seem to favor their production, and which sometimes become epidemic.

It must not be inferred from this statement, however, that either before or since the wide-spread epidemic of autumnal fever in 1858, we have enjoyed a perfect immunity from such disorders, or that the periodical diseases, *always* more or less prevalent during our fall and winter seasons, are confined to regions where the concurrence of all the conditions supposed to be necessary for the production of malaria are found to exist. Such a conclusion would not only be at variance with fact in the first instance, but would lead erroneously, in the second place, to an apparent confirmation of the generally recognized hypothesis respecting the origination of malarial fevers.

Not only "in the neighborhood of exposed river-courses and low places," as stated in our last report, have these endemics been encountered every season as usual, but, as our professional acquaintance has been extended by the increased travel into the mountainous parts of the Pacific States, the same forms of disease have been found occurring in localities where it might be rationally inferred

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they would be least likely to present themselves. It is true they have always appeared in such localities, more or less modified, as will be seen hereafter—varying from the true type in so many particulars as to favor the idea of original disease. But that they are attributable to the same origin we think is clearly evident, although, unless we resort to the much disputed calculations upon the distance to which malaria may be conveyed, the ultimate cause, notwithstanding what we formerly advanced, remains involved in greater obscurity than ever.

Our purpose in describing, in the former report, the origin and progress of the epidemic visitation of autumnal fever in 1858, as far as observations and inquiries enable us to trace it, was to place on record the additional evidence, drawn from the comparatively *terra incognita* of California, respecting the supposed laws or conditions controlling the same — believing that if ever we are to arrive at a full and accurate knowledge of these essential circumstances, it will be by the combinations of such faithfully reported histories of all the phenomena, cosmical, meteorological, topographical, etc., associated with the origin of the disease, and a patient analysis of their details.

The irruption of that epidemic coincidently with the introduction of an extensive system of irrigation, by means of reservoirs and canals, was well calculated to lead to the inference, in this instance, of cause and effect, and to sustain the hypothesis of the conjunction of heat, moisture, and vegetable decomposition as essential to its production. That these conclusions, although at the time thought to be legitimate, are not wholly tenable, subsequent experience has fully demonstrated. For while fevers of an intermittent and even of a remittent type have occurred under the same concurrent conditions, still they have by no means, since then, invariably manifested themselves in a uniform degree or intensity, and never in the epidemic form, which should have been the case if the above-mentioned hypothesis was sustained by fact.

During the six years subsequent to 1858, we have experienced one season of excessive rain, one of great drought, and four seasons of average weather, while the condition of the valley-region with regard to canals, ditches, and reservoirs has remained the same. Notwithstanding this variation, there has been no sharply defined deviation from the average number of cases of fever in any one of these five seasons.

By reference to our tables, it will be perceived that during the

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three years subsequent to 1858, as shown in the percentage of saturation, the relative humidity was actually greater in the months of July, August, September, and October of the following years, than it was during the season of the epidemic; while, at the same time, the temperature, in like manner, was also in excess in the subsequent years. It is evident, therefore, that the combination of these elements in the low valley-region did not constitute the malarial agent. The vapor existing in the atmosphere in an independent state may possibly be more concerned in the agency, but in what mode and to what degree, it is beyond the power of science to determine. It will be observed, by referring to the proper table, that the separate force or pressure of the vapor was decidedly less during the season of the epidemic than in either the preceding or the three following seasons.

To what, then, are we to attribute the origin of these fevers, and to what, the epidemic form assumed in 1858? It was at first supposed by us that, as these fevers always manifested themselves more or less in the low alluvial bottom lands of the valleys, rather than upon the primitive formations, geological structure favored their development; but, as has just been stated, they have been found alike, though not as frequently it is true, among our snow-capped sierras, as in less elevated regions. In our utter inability to meet these questions, it may be replied that the poison of the fever might have remained in the system, and become subsequently developed weeks and months afterwards. Or, again, although we do not believe in the doctrine of acclimation in the broadest acceptation of the term, except in yellow fever, which we recognize as a disease *sui generis*—self-protecting, like smallpox—still, inasmuch as we find the insusceptibility of negroes and of those of mixed blood, born and bred in hot climates, amounts almost to immunity; and inasmuch as, likewise, for the first year or two, natives of the colder climates generally possess the power of resistance to malarial influence, may we not attribute the comparative exemption of our population, during the late year from fevers, especially of the epidemic character, to some peculiar modifying, invigorating property of the climate, productive of tolerance to the poison? We have already pointed out the remarkable escape of the Chinese portion of our population from the smallpox epidemic. May not similar causes, which produce this result, have been operative also with regard to other diseases in the other races? Not that it is to be inferred that the Chinese are to be excluded in the present case. On the

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contrary, while this peculiar people seem to possess a special proclivity to all forms of enteric disease, typhoid pneumonia, and scrofulous affections, it is but seldom that we are called upon to treat them for the more inflammatory forms of malarial fevers. And in this connection we here take occasion to state that our own convictions, after a long residence in Charleston and New Orleans, are that the susceptibility of the different races of mankind to all malarial fevers appears to be in a direct ratio to the whiteness of the skin. And although we are willing to believe, with Dr. I. C. Nott, that climate does not make the race, but that the race was originally made to suit the climate in which nature placed it; still there must be something more than race in effecting this comparative immunity, inasmuch as the insusceptible dark-skinned races are for the most part natives of warm climates and are acclimated at least to temperature. Witness the Iberian part of the population of Europe—also the Malays, Mongols, Negroes, etc.; are they not all originally natives of warm climates?

Leaving, however, the intricate problem of climatic influences in regard to susceptibility to disease, we turn to the more practical part of our subject, and proceed to describe the modifications of malarial fevers in the elevated regions passed under our topographical review.

Mountain Fever.—Under this designation is described by Dr. Ewing, in the *St. Louis Medical and Surgical Journal* for March, 1855, a disease which he considers *sui generis*, appearing only at an altitude of about 7000 feet, and dependent upon the respiration of rarefied air in some mysterious way not explicable; inasmuch as, he thinks, the elevated situation at which the fever occurs precludes the idea of the agency of malaria in its production. This description, states Dr. Robert Bartholow, U. S. A., in his interesting report to the Surgeon General, corresponds to some of the cases which he happened to meet at Fort Bridger, Utah Territory. The latter writer believes that there are two types of the affection —the periodical and the continued—and that these are often so modified by certain local conditions as to be readily confounded, and to present so many variations from the true type as to be considered an original disease. Dr. Bartholow's views coincide so nearly with our experience in cases of this form of disease among travellers returning from Nevada Territory, that we cannot do better than adopt his description entire: "All cases were ushered in by a chill, more or less decided, which lasted a variable period.

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In the febrile stage the pulse was full, quick, frequent but soft, and sometimes dicrotic; the skin hot, dry, and mordicant; the tongue heavily furred in the centre, red and dry at the edges and tip. There were present also intense cephalalgia; aching in the back and limbs; suffusion of the eyes; loathing of food, and sometimes nausea and vomiting. Delirium occurred in several cases during the exacerbations. The remissions were characterized by debility, listlessness, and indisposition to the slightest exertion of body or mind, and a most painful aching of the limbs. The countenance at these periods was vacant, dull, and tinged a dirty-yellow; the pulse small, quick, irritable; the skin moist, perspiring, but sweating was never profuse. Diarrhœa was a frequent symptom: the stools were thin, yellowish, watery, and offensive—occasionally greenish, dark-brown, or black. The urine was occasionally scanty, and deposited an abundant lateritious sediment. The chill was not regular in duration, nor did it usually amount to a distinct rigor, and the febrile reaction was extremely gradual in its approach. In some instances the two stages were coincident, and during the highest excitement a sense of chilliness was experienced. The appearance of the tongue was peculiar—heavily loaded with whitish fur, through which enlarged papillæ protruded: like the 'strawberry tongue' of scarlatina. The most painful, as well as persistent, symptom was the aching of the back and limbs. Having suffered an attack *in propriâ personâ*, I can testify to the acuteness of these pains. By some officers of the army, who had some experience with the pains of denguë, it was likened to that affection, and bore amongst them the name of 'break-bone fever.' There was little regularity in the paroxysms, either in duration or periods of recurrence.

"Two classes of cases occurred, differing only in intensity: the *mild* and the *grave*. The former, if left to the unassisted efforts of nature, after a variable duration, gradually ceased, but manifested a disposition to relapse at uncertain intervals; the latter, however, tended to the continued type, if not arrested by quinia, and was not easily distinguished from the typhoid cases, which, during the early stages, were unequivocally remittent. This is a fact with regard to the behavior of typhoid fever at considerable elevations, heretofore observed—the occurrence of distinct remissions, and it is this circumstance which, in my opinion, has confused the deferential diagnosis of the two affections, creating the impression that they were forms of the same disease—'mountain fever.' The typhoid fever of Utah has other peculiarities beside the occurrence of remissions. Many of those general symptoms, so characteristic,

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were wanting: coma, subsultus tendinum, muttering delirium, floccitatio; but in all were present some mental disturbance and stupor, cophosis, epistaxis, gurgling on pressure over the ileo-cæcal valve, pea green, watery stools; in two instances the 'rose spots,' and frequently the sudamina and sour-smelling perspirations. All the fatal cases were submitted to a post-mortem examination, and the characteristic lesions of typhoid fever invariably found. Holding these views of the nature of the so-called mountain fever, and having treated it successfully by the abortive method—the heroic administration of quinia—it remains for me to account for its origin. I do not hesitate to declare my conviction that the periodical form of mountain fever is a disease of malarial origin, modified by elevation and rarefied air. The cases which occurred in the army of Utah, happened in those men who had served in Kansas, and been exposed to the miasma of the Platte valley on the march over the plains. I saw other cases, and the most violent, amongst teamsters from Missouri and Illinois, who had frequently suffered attacks of undoubted malarial fever. The ordinary intermittents and remittents of the Platte valley gradually changed in character as the troops ascended the table-lands of the Rocky Mountains, until, having reached the south pass, they merged into that febrile state already described, yet not by an abrupt transition. Those attacks which, it is alleged, have occurred amongst the *habitues* of the mountains, are not well authenticated cases of periodical fever, but were rather typhoid, modified, as I have already shown that affection is, by elevation. In Salt Lake valley, mountain fever is extremely common amongst the *newly-arrived emigrants;* much less so amongst the resident inhabitants, who have undoubtedly typhoid fever, but confounded with the periodical fever, and both known under the same local designation."[1]

While subscribing generally to the views of Dr. Bartholow, above presented, we cannot altogether agree with him, that the periodical form of mountain fever is always found among those who may have recently ascended from the low malarial regions into the more elevated; at least this has not been invariably the case in California. Instances have come within the sphere of our observation of teamsters, who have been engaged, during the spring and summer, in their occupation between the Washoe and the Reese River mining districts, returning to Sacramento for treatment, with all the characteristic features of that modified form of

[1] See Am. Journal of the Medical Sciences, p. 329, April, 1860.

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periodical fever so graphically described above. It is true these patients cannot be classed as *habitues* of the mountains, but they certainly sojourned a reasonably sufficient time in the elevated region to preclude the idea of malarial poison having remained latent in their systems. It must be confessed, however, that the type of the fever was somewhat clouded. But is not this attributable to the difference in the density of the air, as revealed by the barometer? We have already shown in our barometric table, as well as in the curve for Sacramento, that the pressure of the atmosphere does not vary in California to an extent sufficient to exercise any appreciable influence upon disease in the valley. May not, however, the diminished pressure alone in the mountain regions, by its physiological effects upon the system, in permitting a free expansion of the fluids, modify the action of the prime cause? The inhabitants of Virginia City, and many of our mountain towns, which are situated from 6000 to 7000 feet above sea-level, must have about one-third atmospheric pressure less than is properly required. Dr. B. Eichler writes, "In most of those diseases which frequently occur here, the effects upon the human organism are more or less as follows: weakening of the joints; less action in the muscular system; increased transpiration and thirst; quickened process of oxydation—which, by the want of oxygen in a rare atmosphere, requires more rapid breathing and deeper inspiration —quicker pulsation and pressure of the blood into the peripheric part; as a consequent, congestion in the capillary vessels, and finally bleeding of those vessels, as a result of too great pressure; also, an increased pressure on the brain, exhibiting itself by headache, vomiting, aversion to food, giddiness, fainting, and inclination to sleep. These effects are most visible in new comers, and grow gradually less as we get accustomed to the influence of this region. A remarkable fact is the quickened act of breathing, caused by want of oxygen in the atmosphere.

"It is stated that a healthy man requires about 30 pounds of atmosphere, and breathes about 20 times in the minute, to receive by normal pressure the necessary oxygen for the organism. According to this statement, we would have to breathe 25 to 30 times in a minute, to receive, by one-third less pressure, the necessary oxygen. This increased action of the lungs requires increased force of all the respirative organs; it must be very oppressive to persons with weak or tubercular lungs, and may be the cause—by weakening and irritating those parts—of bronchitis and pneumonia. I am

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also led to believe that weakening of the joints, etc., and defects in muscular action, may be the cause of inflammatory rheumatism. With the quickened action of the lungs, the action of the heart is increased, as the blood, by not finding the necessary deposit of oxygen, is more forcibly pressed with the lungs, and this, too, must be one of the causes of the above-named diseases, by producing congestion and inflammation."[1]

We are inclined to the opinion that too little attention has been given to barometrical phenomena in the production of disease. Its agency in promoting the health of animals and plants, or, on the contrary, in causing them to sicken or perish, is far from being nugatory. Reverting to the subject of the exemption enjoyed by the primitive formations from malarial diseases, it seems to us to be in a great measure due to their greater altitude, affording a freer circulation of air, a lessened humidity, and a lower temperature. Our topographical sketch shows that there are numerous lacustrine localities even among our highest ranges in California, where the sources of humidity exist in abundance. And, even if the theory of decomposition of vegetable growth is worthy of any credit, which we do not accord to it, however, that element also is to be found there. That malaria, therefore, exists in these elevated regions to a sufficient degree for the production of the periodic form of fevers peculiar to alluvial tracts, and which possess the power of impressing their likeness upon almost every disease coming within the range of their influence, is by no means an illogical conclusion. We are not aware, however, of the occurrence of a single instance of that aggravated and malignant form of malarial fever in the mountainous regions which is met with in the great valley. This fact, while it goes to prove the existence of a less intense degree, a diluted condition, perhaps, of the toxical agent in the elevated regions, should settle any doubt, if it exists in the minds of distant theorists, as to the prevailing constitution of the Sacramento and other valleys in the State being malarious. Lest, however, the idea may be imparted, from what we have just stated, that this formidable form of the malarious pyrexiæ is of frequent occurrence in our lowlands, we must here state, that since the fall of 1852, it has been our lot to meet with but very few such cases. At that time Sacramento was visited by what was generally recognized as a second epidemic of cholera, the first, or more

[1] San Francisco Medical Press, July, 1864, p. 72.

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strongly marked epidemic having occurred in the fall of 1850, when the young city was almost depopulated by its irresistible ravages.

During this last so-called epidemic of cholera we witnessed many cases presenting phenomena so strongly resembling malignant fever, that the circumstance created much obscurity in our minds as to the pathology of the prevailing disease. In fact we doubted at the time, and still doubt whether the epidemic was really cholera, and so expressed ourselves in several published articles. Be this as it may, however, we certainly then encountered several well-marked cases of that pestilential modification of intermittent fever, with which the practitioners of the southern and western portions of the United States are unhappily too well acquainted. The same lesions of innervation and the same consequences of local hyperæmia, so well described by writers, were manifested in the impeded action of the heart and lungs. The system seemed to sink at once prostrate before the first invasion, which, after a protracted duration, was rarely followed by the well marked typical pyrexia. Since this period the sanitary condition of California has been such that the cases of fever presenting the malignant type have been few and far between, and when these have occurred, it has been chiefly among those whose powers of resistance to disease were feeble. Such have generally proved amenable to therapeutic influence, when a correct diagnosis was formed in the initial stage.

By the mortality curve for Sacramento, projected on the barometric and thermometric diagram, it will be perceived, that in a population varying from 12,000 to 20,000, the proportion of deaths is not greater than that of some of the healthiest cities in the world, notwithstanding the fact that stillborn and premature births are included in our mortality tables. It will be noticed, also, by the sudden dip of the curve in February, that our healthiest season is in the spring and early summer months, while our sickliest or most fatal season appears to be autumn and winter; the curve commencing to rise in July, and attaining its culminating point in November, the first of the rainy season, when the air is more or less saturated with moisture. This is in direct contrast to the rule that obtains in isothermal parallels on the Atlantic coast. Over the whole State the dry or summer season is the healthiest, and the wet or winter season the sickliest.

There is still another form of disease that has prevailed in the neighboring elevated regions during the past year, which remains

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to be described in this connection. We allude to the so-called "spotted fever," or *epidemic cerebro-spinal meningitis*, now attracting so much attention in the medical world. But five cases have come under our observation at Sacramento, and in these the disease made its advent by impairing first the functions of the brain, subsequently to which the fatal meningeal inflammation supervened. In two out of the five cases the dyscrasic character of the disorder was manifested in the peculiar pathognomonic ecchymoses. The rapid course of these cases to a fatal termination, all coming together unexpectedly and about the same time, prevented that close observation which would enable us to speak with any accuracy or detail, further than to state that the disease responded here in all its phases to that described in the recent medical literature of the subject. The fact that it disappeared as suddenly as it first showed itself, and that it did not spread, would go to show that it cannot be strongly contagious. Nevertheless, we do not doubt that, under circumstances favoring its development, the disease may radiate from the localities in which it first appeared, as it did in Nevada, and thus conform to one of the laws regulating the spread of infectious disorders in general. The following condensed account of this epidemic is, therefore, not without interest. Gold Hill is a new mountain town situated about one and a half mile south of Virginia City, the capital of the State of Nevada, the topography and climatology of which have already been described.

CEREBRO-SPINAL MENINGITIS, OR SPOTTED FEVER.

By Henry F. Hereford, M.D., of Gold Hill, Nevada.

This disease showed itself here early last spring (1864). So far as I could learn, there were about twenty cases. At least three-fourths of these proved fatal. The disease manifested itself without any apparent changes in the weather from what is usual. But the climate is so variable that changes of weather is the rule, and a continuance of any one kind the exception. Hence any atmospherical deviation which may have occurred was not observed. The disease is *always* ushered in with *pain in the back of the head and neck*—often intense and excruciating. Occasionally there are *rigors* with *cold extremities;* and the attending physician will be apt to think he has a case of remittent fever, so well does the disease in question simulate the latter in its incipiency. *Vomiting*, continuous and persistent, occurs early. This is a feature of the dis.

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ease, that is apt to lead the physician astray in his diagnosis, and therefore worthy of special note. The *post-mortem* gives a reason for the persistency. The pneumogastric nerve is involved in the congestion that has attacked the brain. The bowels are *obstinately costive*. The pupils of the eye are dilated—or one dilated and the other contracted. One eyelid droops down, and the head being flexed backwards gives the patient a singularly staring expression. This peculiar feature, when once seen, is recognized at a glance the second time. The spots, from which the disease has taken its popular name, commence showing themselves generally during the first twelve hours. They are at first very minute in size and appearance, like a flea bite; and gradually enlarge until they reach the size of a quarter of a dollar. They are of the deep purple color of *purpura hæmorrhagica*, covering all parts of the body. The pulse is feeble and quick, the skin cold and clammy, the urine scanty and highly colored, and the tongue heavily coated with a brownish-white fur. All the symptoms are those of malignant, congestive fever. The *post-mortem* shows no lesion of the stomach, liver, spleen, or other organs, either of the abdomen or thorax. In the posterior portion of the brain and superior part of the spinal cord only do we find evidence of the disease that has made such quick and fatal havoc. Here we find invariably the results of great congestion, and, if the patient has survived twenty-four hours, depositions of lymph and the formation of pus. Within this narrow space the disease has spent its force. Here we find sufficient, in the congestive inflammation, etc., to account for all the symptoms noted—the dilated and contracted pupils, the opisthotonos, the vomiting, etc.

Treatment.—This must be vigorously antiphlogistic. If the patient be seen early, notwithstanding the apparent prostration, general *bloodletting*, cupping, stimulating applications to the extremities, cold to the head, etc., must be resorted to. Early attention should be paid to opening the bowels. For this purpose calomel and podophyllin are preferable. As soon as this is done I put my patient on quinia, nux vomica, and calomel. I hold quinia to be one of the best regulators of the circulation we have. For this purpose I employ it, and have never had cause to regret its use in this disease. There will often be great restlessness and nervousness, which it is advisable to combat with an opiate. These are the main indications of treatment; but so violent is the disease in

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its incipiency and yet so insidious, that under every treatment most of the cases prove fatal.

Remarks.—Cerebro-spinal meningitis is very uncertain as to whom it will attack and what locality it will invade. Generally those of bad habits will more surely be its victims; nevertheless, cases have occurred in persons of abstemious habits, in children and young persons in our town and in the adjacent valleys. I have not seen cases enough to warrant an opinion as to what has been or may be its favorite localities, or habits of body most predisposing to its attacks. But, judging from its pathology, I would suppose that hereafter we may look for it in such localities as where we find the usual congestive fever. I consider it a new disease, or, if it be not so, it has been so inaccurately described that we either fail to recognize it, or else, like many other diseases, it has changed in some of its characteristics. War brings many calamities and not unfrequently new and strange diseases.

ADDENDA.—BY THE REPORTER.

Since this report was written, we have, through the courtesy of Surgeon C. S. Wood, U. S. V., and his associate, Dr. A. S. Ferris, been permitted to observe a recent sporadic case of the disease just described, and of which the following notes have been furnished us for publication.

Frank D. Ingraham, aged 25, private, 2d C. C. V., of previous good health, was admitted into Camp Union Hospital, at Sacramento, on the 3d of April, 1865, with the following symptoms, viz: severe pain in the back of the head and neck, preceded by a chill; left eye everted, producing confused vision, except when one eye was closed; pupil inactive, one contracting, while the other was dilated and *vice versa;* numbness and pricking in the arm and hand of left side; pulse 50, and sharp; tongue coated, white; intellect obtuse, without coma; slight opisthotonos, with nervous twitchings; hearing imperfect, except when fully aroused; articulation imperfect.

Diagnosis.—Cerebro-spinal meningitis.

April 3. ℞.—Quiniæ sulph., gr. v.
Spirit. frumenti, f℥j. M.
To be given every three hours.
℞.—Tinct. opii, gtt. xl.
To be given every six hours.
℞.—Emp. epispast. 5 × 8 ad nucha.
Diet, strong beef-tea *ad libitum.*

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4th. No change in symptoms. The same treatment continued.

5th. Pulse a little accelerated—about 55. The same treatment continued.

6th. Patient has less pain in the head; is able to protrude the tongue more perfectly. The same treatment continued.

7th. Patient improving. The same treatment continued, except the dose of tinct. opii to be reduced to gtt. xxx.

8th. Patient still improving. Treatment changed to

℞.—Quiniæ sulph., gr. v.
Spirit. frumenti, f℥j. M.
To be given every four hours.
℞.—Pill hydrarg., gr. v, every night.

10th. This treatment was continued, the patient steadily improving.

16th. The patient is walking about the ward; his eyes are natural; articulation good, and all the organs are performing their functions perfectly, with the exception of the nerves of the left leg and arm, which have not quite yet regained their natural tone.

Remarks.—We insert this case, not because we consider it important in a therapeutic point of view, but for the strong contrast it offers in the treatment with the cases reported by Dr. Hereford, at Gold Hill. At a time like the present, when opium and its alkaloids are so extensively and successfully used in the management of peritonitis with a suppurative tendency, and in inflammations of the thoracic serous membranes, with a view to the prevention of serous effusion, it would be unnecessary to dwell upon the marvellous influence that might rationally be expected, in this respect, from the narcotic treatment. Its efficacy in cerebro-spinal meningitis has been well established by Miner, Hartshorne, Atlee, Lidell, and others. Boudin says that "an *opiate sleep* was often followed by convalescence."

With regard to quinia, however useful it may be in controlling malarial complication, we believe it exerts no influence whatever on the disease. Not so with the stimulus. All the modifications of diseased action we have met with in California are of an asthenic character. Taking this fact in connection with the strongly marked pathological condition of the blood in the disease under consideration, the most striking feature of which is, that its coagulability is almost entirely destroyed, we are decidedly of the opinion that the supporting treatment is absolutely called for.

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METEORATIOUS EPIDEMICS.

In the order pursued by us we come now to treat of those diseases which range more or less extensively over the face of the earth, and which, being hence referable to certain insensible and noxious qualities of the general atmosphere, are denominated *meteoratious*. But three forms of disease, capable of being thus classed, have, in their migratory movements, been observed to assume the epidemic character in California, viz., influenza, typhoid pneumonia, and diphtheria. Whether it would have been more correct to have considered the latter disorder among the exanthematous epidemics already described is extremely doubtful in our own mind. Its frequent association with scarlatina in epidemics justifies the inference that the *diphtherine*, its *materies morbi*, according to Dr. Farr, is some modification of scarlatinine. Still, we do not know that the relationship between these two special disorders is more intimate than that between the two separate classes themselves in which they are ranked, the diseases in both instances being traceable to the same primary source. Nor are we certain that the evidence for the occasional contagiousness of diphtheria is more conclusive than that adduced for influenza or typhoid pneumonia. While, therefore, with due deference to the opinions expressed by the writer of the monograph on diphtheria, we have determined to place this disorder, as we have done. We desire, at the same time, to be understood as maintaining that the real difference between the strictly contagious and meteoratious epidemics consists in the fact that, in the former, "the great majority of cases spring immediately from specific poisons, generated in primary or atmospheric cases, and communicable from one individual to another. Whereas, in meteoratious epidemics, excepting in one or two of them, every case is of atmospheric *origin*; and, in the exceptionable instances, as in the cholera [and to which may be added diphtheria], which is believed to possess the contagious attribute, the great *majority* of cases manifestly arise, not from the diffusion of its contagious virus, but from the existing meteoratious influence." This is in accordance with the views advocated by Dr. Jos. M. Smith, in his elaborate "Report on the Topography and Epidemics of New York," from which we here quote, and whose classification we have adopted.

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INFLUENZA.

"In no disease, perhaps," continues the writer just cited, "are the characteristics of a meteoratious epidemic better defined than in influenza; or, as the disease is otherwise called, epidemic catarrh. Its sudden appearance and rapid diffusion, its migratory movements, and irregular periodical occurrence; or, in other language, its rise, progress, decline, and cessation, show how widely it differs from ordinary contagious and infectious diseases." With most of these well-known peculiarities the disease prevailed extensively over the whole Pacific coast, from the early part of October, 1863, to the latter part of February, 1864. In its history in California we have nothing of greater import to contribute than the complete confirmation of all that has been so thoroughly compiled in the "Annals" of Dr. Theophilus Thompson, illustrative of the similarity of the symptoms during several centuries, and under every different degree of civilization and hygiene. "We find the affection," to use his words, "in our comparatively luxurious days, manifesting the same phenomena as it exhibited when the presence-chamber of sovereigns was strewed with straw, the entrance of aristocratic mansions obstructed with decaying vegetable matter, and a lantern required at night to guide the weary steps of the citizen through the 'slabby streets' of the metropolis."

The winter, or wet season, which this world wide-spread epidemic elected for its visitation in California, was characterized by the blandest and most genial weather ever experienced in the whole extent of the State, much less rain having fallen than the usual average quantity; in fact, it was a season of comparative drought. For this reason, the wet season being always the sickliest, the catarrhal and peripneumonic symptoms predominated. At the same time, the epidemic was readily recognizable from ordinary catarrh by the great constitutional disturbance, especially of the nervous system, entirely disproportionate to the extent of the local disease, strongly resembling in many of its symptoms the disease known as *dengue*. In many cases, however, there was no cough, no sneezing, and none of the ordinary defluxions from the nasal membrane; so that the disease might have been mistaken for the ordinary fever frequently met with, the pleuritic fever of Sydenham, in which there is a tendency to rheumatic or pleuritic symptoms. In other cases, the pectoral complication was more serious in consequence of the insidious progress of capillary bronchitis. A

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sub-crepitant rhonchus, readily detected on the back part of the chest, would, if not heeded, merge, sooner or later, into bronchial difficulty. This was more apt to happen with valetudinarians and the aged, who suffered most severely in every phase of the epidemic. Children, and the robust, proved less liable to its influence, and, when attacked, experienced for the most part the disease in its mildest form; the ephemeral fever passing off on the third day, and sometimes earlier, with a moist skin and profuse perspirations. With respect to the various complications peculiar to the epidemic, our observations square with those of the most eminent writers, in the finding that the pulmonary trouble is not an essential phenomenon, but is attributable "to changes of temperature and other sensible qualities of the atmosphere, as giving rise to the predominance of a certain set of symptoms at one time rather than another. Thus in frosty weather, and during northerly and easterly winds, the catarrhal and peripneumonic affection will be most conspicuous, while in warm weather, and during westerly and southerly winds, the headache, sickness, disordered bowels, glandular swellings, etc., will constitute the most urgent symptoms." This is the testimony of Drs. Pearson and Warren, of Boston, borne out by Sir Henry Holland, and Drs. Graves, Watson, and others. The most constant symptom was the intense mental depression.

Regarding influenza as a condition, not of exalted, but of depressed vitality, dependent upon deranged innervation, according to the views of its pathology, taken by Dr. Graves and Blakiston, and so admirably presented by Dr. Levick,[1] we can thus readily account for the concomitant derangements of the organs of digestion, circulation, etc. "We can comprehend how, when the poison is expended chiefly on the sensorium, we may have buzzings, giddiness, faintness, intense headache, delirium, insomnia. When upon the respiratory centres we have dyspnœa, passive congestions, pulmonary œdema, and the enfeebled lungs left exposed to the assaults of inflammatory or other disease. . . . But in these days of recurrent humoral pathology, it will be questioned how far the disturbance of the nervous system is a primary or a secondary condition; whether the septic influence, acting directly on the blood, may not, in the course of the zymotic changes thus induced, secondarily affect the great nervous centres, which preside over the functions of respiration, circulation, and nutrition."

[1] American Journal of the Med. Sciences, Jan. 1864.

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In relation to the question of the fatality of the epidemic influenza in California, we would here state that we are not aware of any deaths having been directly attributed to the ordinary form of the fever (for we regard influenza as essentially a fever as is enteric or typhus fever) uncomplicated with the results of previous or concomitant disease. The tendency noticed especially by the older writers, of the epidemic to act in some instances as a determining cause, in the development of particular diseases incident to particular persons, clothing them in its own peculiar garb, was strikingly manifested. This tendency was to assume, for the most part, a neuralgic or rheumatic affection. To this effect of influenza on other diseases, Dr. Gairdner, of Edinburgh, in his clinical lectures, has especially called attention. He states that "by the influenza of 1847–8 the whole mortality was increased one-seventh. It doubled the deaths from bronchitis; largely increased those of other acute diseases of the chest, while the aged and the very young, the apoplectic, paralytic, and consumptive suffered out of all proportion to the rest of the population. These deaths, though not set down as due directly to influenza, were doubtless due to the epidemic influence of influenza."

In the barometric and thermometric curve, for Sacramento, this effect is sharply defined. The average number of deaths for 14 years during November and December is 37 and 34 respectively—while for the same months in 1863 it was 45 and 49, showing an increase of eight in November and fifteen in December out of a population of about 12,000 persons. The deaths by consumption alone were doubled, while those by pneumonia and all other pulmonary affections computed together were increased about four per cent. over those the preceding ten years averaged.

The precise bearing of the influenza upon the mortality of the year is seen at a glance in the comparison of the two months of its greatest prevalence with those of the previous year. Thus:—

	November.	December.	Total.
1862	34	29	63
1863	45	49	94
Excess	11	20	31

Thus the actual excess of deaths during the two months enumerated over those of the previous year was 31; a difference, which, when we consider that the yearly increase was only 24, explains more emphatically than any argument can do, the powerfully pernicious influence of the epidemics.

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We have already stated the condition of the weather at the time of the invasion and during the progress of the epidemic to have been such as not to authorize the inference of any connection, direct or indirect, between meteorological phenomena and influenza. Neither were there any cosmical phenomena, such as comets, meteors, earthquakes, or remarkable disturbances of the electrical or magnetical status noted. Nor did the pressure upon our time permit any such refinements of chemical inquiry as the detection of the amount of ozone in the atmosphere. The attempt to do this by means of Schönbein's papers and scale proved altogether unsatisfactory after a brief trial at our hands. It would seem that an ozonometer, having a scale more definite than the tints now employed, and which will cause the paper to be acted on by a fixed quantity of air during a fixed period of time, is still a desideratum.

We are happy, however, to be able to contribute, in this connection, an item in support of the long entertained opinion, which is quite consistent with modern researches, that some of the most minute beings endowed with life exert a powerful influence on conditions of air and water, calculated to affect the health of the higher classes of animals.

During the summer months antecedent to the year of the influenza, as well as during the summer of its prevalence, one of our colleagues in the Board of Health, already referred to, instituted a series of microscopical examinations into the animal and vegetable forms contained in the standing water in different sections of the city, with the view of contrasting the results on the public health after a season of profuse rains, in fact of inundation, and one of a remarkable draught. In the first instance, the conditions usually considered essential to the production of malaria seemed to be all fulfilled: an alluvial soil, fertile, rich in vegetable decomposition, moisture, and a warm sun. To what degree they were operative the following statements of Dr. H. W. Harkness will testify.

"The inundation of December, 1861, took place at a time when our city was best prepared for it. The vegetation, already completely desiccated by the autumnal sun, had almost entirely disappeared; the deposit of alluvion or sedimentary matter buried the remainder. This sedimentary deposit, so pernicious in many localities, was really to us beneficent. Had the supply of water been derived from the drainage of table-lands, covered with lakes

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and swamps, bringing with it the debris of the previous summer's luxuriant growth, together with the myriad germs of plants of a microscopic and larger growth, the results would, no doubt, have been far different. But such was not the case. The water was derived exclusively from the American River, supplied from an exceedingly mountainous and sterile tract of country, furnishing but little of that material which would contaminate the atmosphere, and, beside the cottonwood and willow, but few of the germs for future growth.

"Owing to the above-named causes and the low temperature of the waters, no deleterious effects were apparent on its subsidence. But there were those who believed that much mischief would result from the great numbers of pools left in every part of the city, and that when these became heated by a semi-tropical sun, fevers would prevail to an alarming extent. These sad forebodings were, happily, not realized.

"To the student of natural history these small bodies of water were a great source of instruction and delight. In no place on this continent, perhaps, was there ever a better field for the observation of the microscopic world. In none, owing to favorable accidents, was there a greater diversity of the living organisms which the microscope reveals.

"These bodies of water were the favorite localities of the vast family of microscopic plants, whose germs are in many instances conveyed in the air. Amongst these may be mentioned the *Valvox Globator*, the *Bacillaria*, the *Diatomia Vulgare*, and the great family of the *Conjugatœa*—all of which are so minute as to be invisible to the unaided eye. These, if allowed to multiply without hindrance, would soon fill the water, and, although not noxious in their living and growing condition, would on their death and decay poison the air we breathe. Such results are counteracted by a new set of living organisms more wonderful still.

"All our citizens have noticed the green scum found floating on the surface of shallow ponds, from which they are accustomed to turn with disgust, and ascribe to it some injurious property. Push aside with a cane this apparently filthy covering, and you will observe the water, which but a day or two since was turbid, is now sweet and clear.

"Bring a portion of this green scum under the powers of the microscope, and it is found to consist of innumerable slender cylindrical-formed animalcules (the *Enchelia* of Ehrenberg), whose

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interiors impart the color from their distension with vegetable matter. And thus has this wonderful change been brought about by the innate wants of this living and growing speck, varying in size from $\frac{1}{12000}$ to $\frac{1}{44000}$ of an inch; the matter which would otherwise decay and putrefy is removed and its noxious effects on man and beast prevented. Other pools are alive with *Monads*, still more minute, whose bodies, from the same cause, impart to the water a tint of paler green. Others, again, are teeming with the *Rotifer Vulgaris* and the *Paramecium*, presenting the appearance of a greasy film as they float upon the surface of the water; the *Vorticella Convullaria*, with its wonderful apparatus for obtaining its food; the *Brachionis*, with its tortoise-like shell; the *Vibriona*, with elongated bodies so small as to require an instrument of great power in order to observe them, and many other varieties—all actively engaged either in the destruction of vegetable matter or in preying upon one another.

"In this manner the equilibrium between the minute vegetable and animal kingdoms is preserved by the action of these living atoms, who have well earned the title of 'Scavengers of Nature.' The water is rendered sweet and clear, and many of the fairest portions of earth are made fit for the habitation of man."

How far the remarkable absence of vegetable forms thus shown, and their subsequent decomposition in and about the standing pools of water may have been capable of affecting the general health, or limiting the amount of malarial poison, can only be conjectured. Although their influence is not demonstrable, nevertheless, it was fully confirmed by the actual sanitary statistics of the year in which these deductions were made, contrasted with those of the subsequent year. In this latter year, the continuous series of examinations, which were made with care and with the same desire for minuteness of accuracy, served to show a vast preponderance of vegetable forms—which, when coupled with the fact of the sickliness of the season, and, ultimately, the appearance of the influenza, is well calculated to sustain the generally received opinion of the source of malarial emanations.

It is a well-recognized fact that generally, and under ordinary circumstances, the mortality of a season bears a certain proportion to the amount of sickness occurring; and, although we cannot indorse the attempt to establish the relation by a fixed and undeviating formula, yet we would here avail ourselves of the benefit to be derived from the mortality reports, which, if they cannot be

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made to bear upon this subject the evidence of rigid demonstration, nevertheless may, by a comparison of the season of 1863–4 with the antecedent years, commencing from the time of our last report, enable us to arrive at a well-grounded conclusion. With this view the following table has been prepared, embracing only those diseases usually considered to be more or less intimately associated with a malarial agency.

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Table showing the Comparative Mortality by Diseases of Malarious Origin for Five Years to Sept., 1863, *and from Sept.*, 1863, *to Sept.*, 1864.

Diseases.	Sept.		Oct.		Nov.		Dec.		Jan.		Feb.		March.		April.		May.		June.		July.		Aug.	
	Five Seasons prior to 1863-64.	Season of 1863-64	Five Seasons prior to 1863-64.	Season of 1863-64.	Five Seasons prior to 1863-64.	Season of 1863-64.	Five Seasons prior to 1863-64.	Season of 1863-64.	Five Seasons prior to 1863-64.	Season of 1863-64.	Five Seasons prior to 1863-64.	Season of 1863-64.	Five Seasons prior to 1863-64.	Season of 1863-64.	Five Seasons prior to 1863-64.	Season of 1863-64.	Five Seasons prior to 1863-64.	Season of 1863-64.	Five Seasons prior to 1863-64.	Season of 1863-64.	Five Seasons prior to 1863-64.	Season of 1863-64.	Five Seasons prior to 1863-64.	Season of 1863-64.
Fever, Intermittent	3	2	4	1	2	1	...	2	1	...	...	...	...	...	...	...	...	...	2	...	1	...	1	...
" Remittent	1	...	1	...	3	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
" Congestive, including Spotted Fever	...	2	...	1	...	1	...	2	...	...	2	...	1	2	...	1	...	2	...	...	...	...	...	...
Dysentery	2	...	4	...	3	1	2	1	2	...	1	...	1	...	6	1	3	1	1	...	1	...	2	1
Hepatitis	1	1	1	...	...	...	3	1	2	1	5	...	...	...	3	...	3	1	1	2	...	...	2	...
Total	7	5	10	2	8	3	6	6	5	1	8	0	2	2	9	2	6	4	4	2	2	0	5	1

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Of all the diseases enumerated above, it may readily be seen that for the five years from September to August, 1863, inclusive, there occurred 72 deaths in all, or a fraction over 14 annually. Of these, an average of over five are put down to dysentery—a little over four to hepatitis—and nearly five to the various types of malarial fever. While for the one year beginning September, 1863, and ending August, 1864, we find the total number of deaths to be double the average. Seventeen of these deaths are attributable to fevers alone, including, as we have done, five deaths by cerebro-spinal meningitis, or spotted fever; and it is worthy of remark, that diseases of the abdominal cavity which are far from being exclusively, or even most frequently due to like malarial causes, have been scarcely above the average.

That there occurred not only a greater number of deaths by malarious diseases during the eventful year of the influenza, is thus not only conclusively established by the comparative mortality above stated, but it is also consonant with the experience of every medical man, that, throughout the length and breadth of the State, the amount of sickness from every variety of disease was never known to have been greater. Whether any of those numerous forms of enteric and typhoid affections, manifesting all the symptoms of septicæmia, which crowded upon the attention of the practitioner, were attributable to the change of type in the influenza, so often witnessed with other specific fevers, is a question we are not prepared, at this time, to discuss. But if we have no clear statistical information for deciding this point, we at least find evidence in the universal prevalence of sickness just stated, of an epidemic state of constitution, which, originating with the same causes that produced influenza, rendered the body for a period more prone than usual to certain diseases, the material sources of which are ever more or less present. The fact of the appearance of these intercurrent affections, and the subsequent development of cerebro-spinal meningitis, is in perfect keeping with the history of the disease we have just described, whose periodical visitations in all ages have preceded, accompanied, or succeeded epidemics of the most malignant and pestilential character.

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REPORT

OF THE

COMMITTEE APPOINTED TO MEMORIALIZE CONGRESS

IN REGARD TO THE

MEDICAL DEPARTMENT OF THE ARMY.

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REPORT OF THE COMMITTEE APPOINTED TO MEMORIALIZE CONGRESS IN REGARD TO THE MEDICAL DEPARTMENT OF THE ARMY.

CINCINNATI, OHIO, May 9, 1865.

THE undersigned of the Committee appointed by the American Medical Association to memorialize Congress in regard to the passage of a law for the Medical Department of the Army, and to present the draft of such a law to each Senator and Representative, have the honor to report—

That they took the subject immediately into consideration, but that the time they could command was too limited to enable them to prepare a memorial and draft a law before the adjournment of the session of 1864 and 1865. After an interchange of views among the members of the Committee, necessarily conducted through the mails, a memorial and draft of a law were agreed upon by the majority of the Committee, printed and distributed as directed by the Association, at the commencement of the last session of Congress. This memorial and draft of a law were in the words following, to wit:—

To the Senate and House of Representatives of the United States:—

The undersigned, a Committee appointed by the American Medical Association, at a meeting held in the city of New York, in June, 1864, to memorialize your Honorable Bodies in regard to the passage of a law for the better organization of the Medical Department of the Army of the United States, in the discharge of the duty imposed upon them, respectfully represent—

That if the experience of the previous wars in which the country has been engaged had not been sufficient to indicate the importance and necessity of clothing the medical officers of the army with an absolute military rank, that should settle their authority to execute their own functions unquestioned by officers of other branches of the service, the magnitude of the present contest, and its all-pervading interests, have, in their opinion, forever determined

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this fact. The necessities of present circumstances have forced upon medical officers the exercise of military functions and command, without and even against the authority of law, in some instances, but which is absolutely indispensable to the existence of a Hospital Department. The Act of February 11, 1847, which first conferred military rank upon medical officers, expressly forbids them to exercise military command in the line, or another staff department. Still, from necessity, and in obedience to the orders of the Secretary of War, they now exercise such command, and that under General Orders No. 212, July 9, 1863, emanating from the War Department.

Surgeons in charge of general hospitals are and must be the commanding officers thereof. They are responsible as well for the discipline and administration of those establishments as for the medical and surgical treatment of the sick and wounded. From the nature of the case, none other than a medical officer can discharge these strictly military duties, and wherever an attempt has been made to divorce the military and professional functions in a general hospital, the result has been conflict of opinion and authority, discontent, altercation, and paralyzed efficiency.

Were the claim to an effective and indisputable rank for the Medical Department novel in principle in our service, it might be plausibly controverted; but when the propriety and advantage of such rank in staff departments have been so completely settled as they have been by the examples of the Quartermaster's and Subsistence Departments, it cannot now be successfully refuted.

Brought into immediate contact with, and exercising the immediate control over thousands of soldiers, charged with the care of their pay, subsistence, clothing, and discipline while in the General Hospitals, the Medical Department alone is assimilated in functions to the officers of the line, and is *de facto* compelled to exercise military command over the persons of soldiers; and whatever of failure there may have been to meet the full requirements of their duties in these respects, is, in our opinion, distinctly to be traced to the defenceless position in which they are left in regard to the interference of other officers possessing the immense advantage of unqualified military rank, with their own management of their own departments.

The grade of the medical officer in command of a general hospital should, in our judgment, never be less than that of a field officer. Many of these establishments contain more than one thousand

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soldiers, some of them more than three thousand, a command equal to that of a brigadier-general. The medical directors of armies and military departments have only the rank of majors, and even this restricted, while the chief quartermasters of the same are invested with the unrestricted rank of colonels—the latter exercising no command over soldiers, while the former have from ten to twenty thousand military persons under their control. They are at the same time responsible for the careful and economical distribution of vast amounts of public property, and without the experience and ability in this special department, which long and careful training alone can give, the money value of the loss of life which would result would certainly equal the expenditures of the Quartermaster's Department, vast as they are. With at least equal responsibilities, and equal zeal, and equal devotion, the medical officer is denied an equal rank with the quartermaster, and even the limited rank which is conceded to him, is so clogged with restrictions as to be of little avail for the public good.

We, therefore, pray your Honorable Bodies to give these evils your serious consideration, persuaded that the result will be such a remedy as will satisfy the claims of equity, of justice, and of the best interests of the service.

The Committee having been further instructed to prepare a bill for the consideration of Congress, and "to embrace in its provisions a further separation of the Medical Department from the Commanding Officers of the Line, in order to have a more perfect and unrestrained control of its interests and greater efficiency in that branch of the service," in the fulfilment of this duty, beg leave to present the following sketch of such a bill as they think would meet the views of the American Medical Association, and secure the objects they desire.

1. The Medical Department of the Regular Army shall consist of—

One Surgeon General—Brigadier General:

One Assist. Surg. General—Colonel
One Purveyor General—Colonel
One Inspector General—Colonel
Twelve Staff Surgeons—Lieut. Colonels
} of Cavalry:

One Surgeon (Major); one Assistant Surgeon (Captain), and one Assistant Surgeon (1st Lieut.) for each Regiment of Artillery, Infantry, and Cavalry, for the Ordnance and for the Engineer Corps:

2d. For the Volunteer Army whenever called into service:

One Assistant Surg. General, one Purveyor General, and one

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Inspector General: Staff Surgeons as many as are necessary for the command of the General Hospitals, with the same rank as the same officers in the regular service:

One Surgeon (Major), one Assistant Surgeon (Captain), and one Assistant Surgeon (1st Lieut.) for each Regiment of the Line actually in service.

Candidates for the appointment of Assistant Surgeon shall be examined by a Board of not less than three Medical Officers of their own branch of the service.

A second examination by a similar Board shall be required for promotion to the rank of Major.

General Hospitals and their guards shall be under the command of the Medical Officer in charge, subordinate only to the commander of the Department or Army in which they are located.

A Hospital Corps, consisting of companies of sixty men each, shall be organized as companies of Infantry for duty as nurses, cooks, and guards to General Hospitals.

Promotions in the Medical Department of the Regular Army and volunteers shall be made in accordance with the principles that govern in other departments of the respective forces.

The Medical Director of an Army in the field or a Geographical Military Department shall have the local rank of Colonel of Cavalry.

Medical Purveyors of principal Depôts (Surgeons in the regular Army or volunteers) shall have the local rank of Colonel of Cavalry.

Physicians employed by contract shall have the local rank of 1st Lieutenant at the Hospitals or Posts where employed.

All acts or parts of acts inconsistent with this act are to be repealed.

We have the honor to be, very respectfully,
Your obedient servants,

(Signed) CHAS. S. TRIPLER, M. D.,
CHRIS. C. COX, M. D.,
FRANK H. HAMILTON, M. D.,
D. L. McGUGIN, M. D.

In preparing this memorial and draft of a law, your Committee found it difficult to reconcile conflicting views and interests, the natural result of the distinct organizations, regular and volunteer, then in the service. They did not think that a law applicable to the then existing state of the department only, would fulfil the expectations of the Association. What was wanted was a plan for a permanent and not a merely temporary organization; a plan capa-

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ble of being contracted to the limits of a peace establishment, still preserving its integrity, and, at the same time, of being instantaneously expanded sufficiently to meet the requirements of an army large enough to carry on any war in which the United States may hereafter be engaged.

It is evident that in time of peace, none other than regular troops can compose the army of the United States—it is equally evident that in time of war the greater portion of the troops in service must be composed of volunteers. If a plan had been proposed to merge the medical departments of the two descriptions of troops into one, and if such plan could be successful, it is plain that upon the reduction of the army all would become regular again, and upon the next occasion the distinction would be renewed and its conflicting interests and antagonisms, if they exist, must inevitably be revived.

The great objects of your Committee have been, first, to provide a medical staff for the land forces of the United States adequate to any emergency that may arise; and, second, to clothe the officers of that staff with a military rank that would forever settle the question of their subordination to officers of inferior rank in the other branches of the service.

Previously to the breaking out of the rebellion, the largest armies we have ever set on foot were insignificant in comparison with the enormous hosts that have been kept in the field for the last four years. For the last fifty years, with the exception of the Mexican War, the United States may be considered to have enjoyed uninterrupted peace. Our small force was distributed in scattered posts over the vast surface of the country, in detachments so small as to require little of a medical department beyond the mere prescribing for a dozen men daily at a post hospital. The military mind of the country could perceive no necessity for any military authority being conferred upon a medical officer, and this mind had indolently and thoughtlessly drifted into the idea that such an authority was preposterous and absurd. The school of the last four years has, however, done much toward dissipating this delusion. The wise and thoughtful, particularly in the higher grades, no longer cling to this mouldy fossil, and the present Secretary of War, by conferring brevets upon several medical officers both regular and volunteer, and the Congress of the United States by enacting a law conferring the unlimited rank of colonel and lieutenant-colonel upon medical directors, has settled the principle that the medical

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staff is a military branch of the service, equally with the quartermaster's and subsistence departments.

The medical profession owes much to the Hon. E. M. Stanton, Secretary of War, for the several orders he has issued and enforced, conferring the independent command of the general hospitals upon the surgeon in charge, and placing under their command the officers and men constituting the Second Battalion of the Veteran Reserve Corps, thus removing a military disability from medical men, as fatal to their efficiency as it was insulting to their self-respect.

But the laws in reference to the present organization of the medical department of the army, with the exception of that in relation to medical directors, expire by their own limitation with the present war; when the country is declared pacified, things revert to their *status ante bellum*, and without further legislation, the people and armies of the United States are doomed again to encounter the confusion and disappointments necessarily consequent upon the entirely inadequate organization of the medical department for a state of war.

By attending to this matter now, and by making suitable provisions for a medical department, susceptible of expansion to meet every emergency, this confusion and disappointment may be avoided, our troops always provided with a competent hospital establishment, the mode of appointment of medical officers fixed by law and not left to the caprices of politicians and the chances of a ballot, and thousands of lives and millions of money saved to the nation.

By leaving the question of organization unsettled during the approaching interval of peace, which God grant may be a long one, we are certainly doomed to incur, upon the breaking out of another war, the same evils that have marked the inception and progress of this, and we shall require a repetition of the same severe lesson of suffering, to educate once more the military mind of the country up to a point that will induce it to yield a tardy and reluctant assent to the now patent fact—that the medical department is as essential to the organization of an army as the engineers, and that an efficient medical department cannot exist without a recognized military position. With these views your Committee would be insensible to the teachings of the past and to your just expectations, if they should fail to urge upon the members of the American Medical Association their earnest recommendation that, as an Association, they shall reaffirm their convictions of the necessity

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for immediate legislation in reference to the military rank of the medical department, and as individuals each shall pledge himself to use all honorable influences with the Representatives of their several Congressional districts, and the United States Senators from their States, to induce them at the next session of Congress to enact the law sketched out in the draft of your Committee, or some other law based upon the same fundamental principle.

All of which is respectfully submitted.

CHARLES S. TRIPLER, M. D.,
CHRIS. C. COX, M. D.

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REPORT

OF THE

COMMITTEE ON THE RANK OF THE MEDICAL OFFICERS OF THE NAVY.

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REPORT OF THE COMMITTEE ON THE RANK OF THE MEDICAL OFFICERS OF THE NAVY.

To the Hon. GIDEON WELLES,
Secretary of the Navy of the United States.

The undersigned, members of the American Medical Association, have been appointed, by the Association, a committee to memorialize you on the subject of the rank of the medical officers of the navy. The attention of the Association has been called to a memorial addressed to you by a number of the line officers of the navy, and published in the *National Intelligencer* of Oct. 7th, 1863, urging you to reduce the rank of the staff officers, including the surgeons and assistant surgeons. It appears to the undersigned that there are good reasons why the relative rank of the medical officers of the navy should be increased rather than diminished. It will probably be conceded that the average education of the surgeons and assistant surgeons is not inferior to that of the line officers. They are appointed, not through political influence, but after a searching examination, by which their scientific acquirements are thoroughly tested. Their duties are, in general, quite as arduous as those of the line officers, involving a high degree of responsibility, for which they can only be fitted by a long course of patient and persevering study. The acquirements which are necessary to enable them to pass the examination which they are required to undergo would place them in an influential position in civil practice, and would insure to them a reputation and a remuneration which they can never attain in the naval service. The line officers have opportunities of distinguishing themselves by brilliant exploits, and of securing popular reputation and official promotion, which are denied to the medical officers. According to the present system, the line officers may rise successively through all the grades of rank to the distinguished position of Rear Admiral, while the surgeon who has been longest in the

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service, and who has performed the duties of his office with the greatest skill and success, cannot rise above the grade of captain.

The medical officers of the navy are exposed to the dangers of battle nearly in the same degree as the line officers, and they are much more exposed to the dangers of pestilential diseases.

In consideration of the scientific acquirements of the medical officers of the navy, of their arduous and responsible duties, of the important services which they render to the officers and sailors when sick or wounded, and of the small remuneration which they receive compared with that which they would receive in civil practice, the undersigned would recommend that such a change should be made in the existing regulations as would enable surgeons after fifteen years' service to rank with commodores. An additional inducement would thus be offered to experienced naval surgeons to continue in the service, instead of seeking more lucrative employment in private practice.

JAMES ANDERSON, M. D.,
President of the New York Academy of Medicine.
ALFRED C. POST, M. D.,
Professor of Surgery in the University of New York.
GURDON BUCK, M. D.,
Surgeon to the New York Hospital.

A copy of the above memorial was transmitted to the Senate and House of Representatives of the United States.

JAMES ANDERSON,
Chairman.

New York, Dec. 14, 1864.

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REPORT

OF THE

COMMITTEE ON MEDICAL EDUCATION.

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REPORT OF THE COMMITTEE ON MEDICAL EDUCATION.

"*Resolved*, That it is desirable that a uniform and elevated standard of requirements for the degree of M. D. should be adopted by all of the medical schools in the United States, and that a committee of seven be appointed to report on the subject."

Committee for 1865: Drs. THOMAS ANTISELL, D. C.; GEO. FRIES, Hanovertown, Ohio; E. K. PEASLEE, N. Y. City; J. F. HIBBARD, Richmond, Ind.; C. W. PARSONS, Providence, R. I.

This Committee beg leave to offer the following:—

When the medical profession of the U. S., at their meeting in May, 1846, thought it expedient that a National Medical Association should be founded for the maintenance of their honor and respectability, they based that conclusion upon a belief, well founded at that time, that the requirements for the degree of M. D. were not uniform in the several colleges, nor sufficiently elevated in correspondence with the progress of general education, and that the majority of those entering the profession had not a suitable preliminary education.

Every returning year finds the Association still desirous of further advancement, and every report made by the Committee presents some plan to accomplish the desired objects.

Nor without some good results; the oft-repeated recommendations made to the schools upon the subjects and methods of instruction have accomplished much, and if the hopes and wishes of the profession have not been realized, it is owing to impediments which neither this Association nor the colleges can remove without united action.

The colleges to whom this Association has within the last twenty years made recommendations to increase their curricula, have in response enlarged the term of the course and increased the number

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of subjects taught, and the medical colleges of this country, generally, and especially in the larger cities of the Eastern and Middle States, have always shown a willingness to adopt any suggestions having in view a higher standard of medical attainments.

In treating of the method of elevating the profession by means of an educational standard, the subjects are naturally arranged in the following order:—

1. The scholastic or preliminary education.
2. The period of pupilage.
3. The medical education proper.
4. The conferring of the license to practise.

A grand defect at the very outset of medical education is the placing a youth within the portals of study, whose inclination and attainments have not been directed to that end. In one of the most intellectual and cultivated of professions, no care is taken at the entrance to exclude the grossly ignorant, or the mentally incompetent. A good general education is the means by which the teachings of the science are comprehended, and no amount of extension of curriculum or thoroughness of didactic teaching will compensate for a neglect or non-possession of the avenues of learning.

The general absence of any requirements called for by preceptors or colleges in the way of standard of preliminary education is much to be regretted; it is as much to be deplored now as it was when the Committee of 1847 made their report. A long acquaintance with the actual education of young men who have just graduated at the various medical schools of the United States has satisfied some of the Committee that there is no defect so glaring, no one which is so irremediable in after life as this. A deficient knowledge of the collateral branches of medical science may be subsequently studied and easily mastered, if the general preliminary education be good. A scanty stock of medical professional lore may be augmented, and the progress of the young man in medicine may go on *pari passu* with his years, but a defective preliminary education can never in the majority of cases be supplied.

There is a very wide chasm between the sum and the nature of information taught in the common schools and that given in our colleges, which is generally but that of a higher school or academy. Now, very few indeed of the attendants in our medical colleges have received more than a mere English education such as that which the ordinary school of the district communicates. In such,

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not only are the rudiments of Latin not taught, but the really more useful branches of logic and intellectual philosophy are completely ignored. Hence, not only has the youth not acquired the elements of thought and reflection, but, what is more to be regretted, he has not learned *how* to think.

The examinations of our military medical boards during the war have brought out this deficiency into very prominent light. Nothing is more common, in written examinations of candidates, than to meet with glaring transgressions of orthography and syntax, of sentences incomplete, evincing ideas not only expressed in barbarous English, and at defiance with all rules of grammar, but even the ideas themselves are so vague and confused as to have little meaning and less point.

It may here be remarked that the requirements demanded in the present century for a youth educated for the professions are not supplied by the existing colleges and literary institutions. Too much time is still occupied with the old methods of instruction in Latin and Greek, to the exclusion of the natural sciences and the modern languages (French and German). This is more felt in the study of medicine or other branches of knowledge dependent on the progress of natural sciences than in the clerical or legal professions.

While it is always to be deplored that an ignorant man enters the ranks of the profession, the proper nature and extent or standard of education has not been so equally accepted. Up to the second quarter of this century, the classical scholar (as he is termed) was held to be properly educated to commence medical studies; that is, the college degree in arts was prescribed as the preliminary in the old universities; but the immense development of experimental science since 1840 has called for some acquaintance with it, rather than with ancient classics, in order to understand medical progress; and if we desire to know in good time what is actually going on in Europe, in medicine or any other science, we must read the journals in the vernacular, and thus the living languages become of more importance to the medical man than the dead. It has always been deemed desirable that some amount of information on these two subjects—that is, experimental philosophy and modern languages (French and German)—should be required of pupils before matriculation, and our universities ought to recognize this necessity by modelling a degree in philosophy which would imply the cultivation and teaching of modern science within their walls;

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this degree might be required as a necessary preliminary to graduation in the doctorate. Such a degree should presume a thorough English education, attendance on courses of experimental philosophy, and a proficiency in French and German, and this is believed to be the proper basis on which to establish the medical curriculum.

The manner of securing a sufficient amount of education before attendance on medical education, and where the power should exist to enforce it, are questions on which the profession are not agreed. The Association has no alternative but to recommend, and it is expecting too much to suppose that all institutions are able at once to adopt their recommendations; nor can this Association expect that, at the present time, individual medical men will apply this test to the youths entering their offices. Whenever the license to practise is attainable *at one* point in a State, and by a uniform plan, then, and *then only*, can a regular and elevated standard of preliminary as well as professional education be required of the candidate. Until that time shall arrive, the only influence which the society can exert is to recommend to preceptors and to the schools the enforcement or adoption of some preliminary examination to test the general education in the case of a student presenting himself for matriculation or attendance on his first course of lectures.

The subjects comprised in the examination should be:—

1. Elementary education, evidenced by a fair amount of English studies—grammar, geography, history.

2. Specimens of handwriting on the occasion.

3. Arithmetic, algebra, rudiments of geometry.

4. Latin—translations from Cæsar's Commentaries; a knowledge of either French or German, so as to translate prose.

A preliminary examination of a character similar to this, but somewhat more strict, has been recommended by the English Medical Council in the latter half of the year 1863, and such a test is in force for the public offices and departments under the British government.

The subject of medical pupilage has occupied a fair share of every report made to the Association, and of late years the impression gains ground that it is not the best mode in which the time of the young student in medicine could be occupied.

In large cities and towns where medical colleges exist, a student may valuably employ his time in the office of a physician, but the

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greater part of the benefit in such cases is traceable to the presence of the medical colleges and the facilities thus afforded to his study.

In the remote country, a pupil has little means of learning his profession in the office of a doctor, who does not deem it his duty to devote himself to the special instruction of his pupil, and could not instruct him if he would. Such pupilage neither affords the youth an opportunity of obtaining knowledge by observation, nor does it give him habits of study and thought, so necessary to be formed early in life. The time of the pupil might be more profitably spent either in the literary college or academy, acquiring the needful preliminary education, or, in the preparatory medical schools, of which too few are in operation in this country.

Your Committee look upon this system of taking pupils as one of the methods of entering the profession now justly becoming obsolete, and that every year spent as a pupil in an office is so much time taken from the legitimate modes of instruction, *i. e.*, the hospital and the school. The system of taking pupils tends to check the liberty of future action in the student, and to deprive him of that choice in educating himself where and how he thinks best—a choice which ought not to be interfered with.

The suitable preliminary education referred to will generally occupy youth up to eighteen years of age, and three years at least should then be devoted to the acquirements of professional knowledge at the hospital and in the lecture room, and thus there appears no place for attendance in the office of a physician.

The medical education of youth ought to commence in a preparatory school. In such an institution all the "collaterals" of medicine should be taught; those branches which a student is now expected to know, but which are rarely taught to him—such as statics, dynamics, the rudiments of chemistry, theoretical and practical pharmacy, and materia medica, comparative anatomy, animal and vegetable physiology, and botany.

Indeed, all of the subjects recommended to be taught during summer in the medical colleges would properly be embraced in the instruction given in these institutions.

The mode of instruction in these primary schools of medicine should be different from that in the medical colleges and universities, for while in the latter it is didactic and professorial, in the former it should be by recitation and tutorial—upon the plan of question and answer—and by a copious assortment of models and drawings, a well stocked cabinet of materia medica and pharma-

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ceuticals, and by teaching the student the outlines of chemical analysis, the "medical academy" might be made a valuable adjunct to the college or university, and attendance for one year would be to the student much more profitable than any system of previous pupilage. After a year so spent the student would learn much more of his profession by his studies at college.

It has been found by experience in the higher seats of learning that mere professorial lectures are not sufficient to make any student proficient in a liberal profession; the aid of the private teacher has been called in and by recitations frequent and covering the whole field of medical knowledge the candidate becomes grounded in the elements of the sciences.

The most valuable portion of the education gained at universities in Europe is that obtained in the classes of the tutor, and it is believed that by the adoption and engrafting of the system of class recitations with the lectures of the professors a great improvement in teaching medicine will be effected.

It may be objected that at present the collegiate professors examine their classes weekly to test the student's proficiency and progress; but this examination is trivial, occupies but a few minutes, and is not at all a fair example of class examination by tutors, and is almost worthless from the limited term which can be spared by the professor who needs his full hour for the treatment of his subject proper *ex cathedra*. It may also be objected to this proposal to engraft the tutorial upon the professorial duties as a part of the collegiate system, that the recitation system does exist; that in every city where a medical college exists, there are generally one or more private classes, managed by private enterprise outside of the college rooms. Admitting this, it only shows that it is needed in addition, and is an important aid, since the student willingly pays the additional tax; but what is sought for here is that such should form a portion of the system of collegiate instruction to be carried out by a corps of adjuncts, with the use of the college instruments and means of teaching, by which it would be rendered more general and effective; and it is recommended that the society bring this plan before the notice of the schools.

If this junction cannot be effected, then preparatory medical schools or academies should be encouraged in proportion to the facilities which they afford to the student.

The Committee have been thus minute in detail on the subject of primary medical instruction, believing firmly that it is the need-

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ful first step to be taken by the student in our profession, and that such system will yet become a necessary institution as an adjunct to the college; that such preparatory school will supersede the office of the physician-preceptor, and be of great benefit in the future mental growth of the youth: as it is there where the physical phenomena of organic and inorganic matter are to be learned, so there the incept should be laid, and the habit of study obtained.

With respect to the existing state of medical education your Committee deemed it expedient to collect new returns, and in conformity with the regulations originally published regarding this report, a circular letter was addressed to all of the medical colleges, which owing to the civil war were within reach of mail deliveries. Thirty-three institutions were addressed, and twenty have replied in full. The points of inquiry upon which answers were requested were:—

1st. Number of matriculated students.

2d. Number of graduates.

3d. Number of professors in faculty.

4th. The length of the courses.

5th. Whether more than one course was given annually?

6th. Whether hospital attendance was required, or only recommended?

7th. Whether dissections were required, or only recommended?

8th. Whether in the State there were other requisites than the possession of a degree to allow practice?

The results of the replies have been tabulated in the form of a synopsis which is appended to the report.

Although it is to be regretted that a full statement of the condition of medical colleges and instruction in this country cannot be given here, owing to some of the colleges addressed having neglected to reply, yet sufficient is perhaps shown in the returns made to justify the following remarks.

It appears that the twenty colleges represent 3209 matriculants and 1001 graduates, being probably two-thirds of the whole number of under-graduates entering the medical profession; in the United States the whole number of medical students might be about five thousand.

In the twenty-one colleges where results are tabulated, six subjects are taught in all of the institutions, viz: anatomy, physiology, surgery, practice of medicine, materia medica, and obstetrics.

Military surgery and hygiene are only taught in seven schools

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or one-third of the whole number; forensic medicine in eleven, or only one-half the number. Dissections are required in only twelve colleges, and hospital attendance in ten; microscopy taught in six schools; ophthalmic and aural surgery in only three; pathology in two; histology in one; while botany, practical chemistry, and cutaneous diseases are not taught in any special course.

By inspection of the synoptical table appended, these and other similar inferences may be deduced, and an attentive consideration of it will force the conviction on the reader's mind, that the sum of medical information taught is as much as can well be offered or mastered in two years, but is manifestly very incomplete in its nature, and wholly unable to make an educated physician.

Through the favor of the Surgeon-General's Office, U. S. A, an opportunity has been afforded of examining into the requirements of the German universities from candidates who desire to graduate, and the following embodies the important information thus obtained.

In the majority of these universities, a certificate of age and primary qualifications (*testimonium maturitatis*) is required before admission to the lectures of the faculty of medicine; this certificate states that the candidate for matriculation has completed his course in a college or high school, and is fully prepared to enter the university. An exception is made in favor of those who seek to push their medical education no further than graduation; for the mere act of graduation does not, in Germany, entitle the individual to practise medicine or surgery.

Four years of medical study and attendance on lectures are required of candidates for the degree of M. D. The academic year consists of two terms, viz: Michaelmas and Easter, the time included in both terms is nearly eight months.

Eight terms are therefore required for graduations, of which six terms must be spent in the university of their native State.

After this period of attendance those proceeding to the degree of M. D. are examined by the University Board. This constitutes the first examination of those desiring to apply for the right to establish themselves in their native State.

The Second Board is one sometimes appointed by the State; sometimes it is a single officer, the Medical Director, a military official, who examines and grants the license to practise in a special locality; without this license no practitioner can collect fees or be legally recognized as a medical man.

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The following is a plan of curriculum of four years' study in two of the Universities of good standing (Marburg and Wurzburg).

FIRST YEAR.

First Term	Chemistry, Mineralogy, Natural Philosophy, Osteology.
Second Term . . .	Special Anatomy.

SECOND YEAR.

Third Term	Physiology, Zoology, Botany.
Fourth Term . . .	Materia Medica, General Pathology, Practical Anatomy, (Dissections.)

THIRD YEAR.

Fifth Term . . .	Nosology, Therapeutics, Fractures and Dislocations, Obstetrics.
Sixth Term . . .	Ophthalmology, Diseases of Women and Children.

FOURTH YEAR.

Seventh Term . . .	Surgery, Special Pathology, Psychological Medicine, Psychological Clinics.
Eighth Term . . .	Diagnostics, Clinical Medicine, Operative Surgery, Forensic Medicine.

The lecturing faculty consists of three grades of lecturers:—
The ordinary professors.
The extra-ordinary professors.
The private teachers.

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The extra ordinary professors are generally selected from the class of private teachers, and are the material from whom the ordinary professors are selected.

Besides the universities there are lyceums, gymnasiums, and colleges, a species of higher schools in which all branches of preparatory knowledge are taught, and which are frequented by those who subsequently enter the university.

In those institutions in Great Britain where degrees are granted, the length of the curriculum is fixed at four years, at least in institutions of high character; and some licensing bodies who do not educate demand four winter courses of lectures to be attended upon. In the larger schools of London, Dublin, and Edinburgh, a very extensive curriculum of the collateral subjects are taught; and many small courses, complete in their way, are delivered on special branches of clinical and operative medicine. The extent and thoroughness of the system of teaching in Bartholomew's and Guy's Hospital Schools are worthy of consideration of the kindred schools of this country.

Not only is there needed a more extensive period of study and a larger curriculum in our medical colleges, but more method is needed in the way in which the departments of the science are taught so that the student may pass *gradatim* from these less strictly to those peculiarly *medical* in their scope.

The subjects taught should be distributed throughout the year, so that while the collateral sciences and shorter branches of education might be taught in the spring or summer session, the winter courses might be devoted to the sciences strictly medical.

In the short spring or summer courses, there might be taught comparative anatomy or elements of histology, forensic medicine, including jurisprudence and insanity, botany, hygiene civil and military, practical chemistry, elementary statics and dynamics.

Your Committee are of opinion that the majority of these latter studies should be entered upon during the first year of student-life, and by acquiring a knowledge of such then, he is more fitted for being benefited by the teaching of the preceptor, physician, or public lecturer.

With respect to the teaching in our medical schools, it is apparent that the curriculum of medical education in the majority of colleges is defective, both by the cursory manner in which some subjects are brought before the student and by the omission of others: and this arises out of the rivalry between different schools and the

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want of a wholesome public opinion, springing out of the profession itself, which should sustain those colleges and schools who make efforts to extend the period and enhance the value of instruction.

Of the material of education, it may be asserted that botany, zoology, comparative anatomy, medical physics, are not taught at all; and that pathology, histology, practical chemistry, hygiene, and medical jurisprudence including mental alienation, are very imperfectly taught in the majority of the colleges. Ophthalmic, cutaneous, and dental medicine are so completely ignored as to leave these branches almost outside of the profession and either in the hands of pretenders, or to be cultivated solely by experts.

In support of this view the Committee further remark specially on some branches of knowledge which are not sufficiently obtruded on the attention of the pupil.

1. Forensic medicine is never treated of to the extent which its importance demands; in the majority of schools toxicology only is descanted on: in a few cases it is a member of the legal profession who lectures, and then it is simply legal medicine which is the subject, and the *laws of evidence* are chiefly dwelt upon. Rarely indeed is the important subject of insanity introduced.

2. The science of physiology is one of so much importance that the student should thoroughly understand it, and which is not yet so extensively taught and illustrated as it should be, that your Committee recommend the society to express its conviction that this subject demands a chair for itself in every school, and that it cannot be taught thoroughly along with anatomy: its connection with chemistry and pathology are so close, that in the present day it is more allied with these branches than with anatomy.

3. The science of chemistry is very imperfectly handled in many of our medical schools and colleges; some courses are given with a great bearing towards physics, in others much time is spent unnecessarily on metals and compounds of inorganic bodies, not useful to the future medical man, and in very few schools indeed does the teacher recollect that it is only medical chemistry—the *chemistry of organic metamorphosis* which is needed to be taught. Every year chemistry forms a more necessary subject of knowledge, and it is impossible to understand modern physiology without a competent knowledge of it. Practical chemistry should be taught in all of our medical schools, and attendance on a three months' course should be required from candidates for the degree.

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4. The period of three months to be steadily devoted to dissection was recommended in the report of 1847, and is still required as the maximum period in some colleges and not required at all in others.

As this is manifestly too short a space of time for a student to attain even a respectable knowledge of the human frame, it is recommended that a period of six months, that is, of two trimonthly periods, to be attended during separate sessions, be recommended to the colleges.

5. In the commercial cities the schools of medicine have become connected with hospitals, and thus conformed to recommendations of this Association made some years ago; but the practice is by no means general, and a further recommendation should be made by the Association to those medical colleges who have neglected to comply with this practical necessity.

The good effects of the close connection of the hospital and school, is apparent in the superior information acquired by the student of those institutions where both coexist; and affords the justification of the demand of this Association upon the colleges.

Ever since the formation of this Association, its most active members have brought the question of the separation of teaching medicine and of licensing practitioners before its meetings. Dr. Bartles, in 1846, advocated one board of licensing to be formed in each State composed of representatives from medical colleges and from the profession at large, and almost every subsequent report has spoken favorably of the advantage which would arise from the dissolution of the two functions now exercised by colleges; and have recommended some method similar to that of Dr. Bartles for granting a license to practise.

This is confessedly the most difficult problem in medical polity; namely, to have education so methodized that the last step shall necessarily include the true and faithful performance of every previous one. Whether this revision and censorship of studies can be best accomplished by the old machinery or by new is difficult to determine.

The real embarrassment does not lie in the collision which might be feared between the medical colleges and this society.

Your Committee, as before stated, are convinced that these institutions will go hand in hand where they have the power with the profession at large.

It is the confederate and social construction of our country which

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is the true embarrassment. It presents the difficulty which the profession ever feel how slowly and unwillingly a State gives any privilege or protection to regular medicine, how unwilling it is to interfere with free trade in medical education, even where the lives of the community are concerned, and it opens up for consideration the broad question whether it is advisable that the State should interfere to even determine whether the education obtained is of that amount and character which would justify its possessor in taking charge of the health of the community.

That the State does interfere to determine at times whether the practitioner is possessed of a proper amount of skill and knowledge is evident upon trials of malpractice, and although it is thus done only under conditions, yet it has never been contested that the State does not possess the authority; and if possessed, it is clearly an unconditional power, no matter how it may be exerted. The right to interfere, then, exists; it is now simply a question of expediency.

In Europe, where the conservative influences of Government are ever at work to resist the intrusive and democratic efforts to pull down old existences and set up new popular idols, the right to regulate the liberty of practice is now exercised by every civilized State, and that in the face of the gradual popularizing of public bodies and the breaking down of privileges possessed by corporations.

The health of the community has been taken into State keeping by determining what constitutes a properly educated physician or surgeon.

But there is no interference with the methods of education; these are left wholly at the regulation of the colleges and medical schools; the State merely declares its right to care for public health by examining into and determining the standard of education for a public or private practitioner.

In the employment of a permanent medical staff for the military and naval services of our country, the right to determine the curriculum and to see that the education of the candidate for entrance into service is up to the standard required has been assumed; for not only in the *regular* but also in the volunteer branch of the military service has this right been exercised, and with such signal benefit that it has not merely induced the applicant entering these two divisions of the medical staff to study farther and educate himself more highly by further dissections and attendance on school

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and hospital, but it has stimulated the institutions to higher teachings and more modern science: and by the authority thus exercised the services of a large body of medical men have been obtained whose education and acquaintance with their profession at the time of entrance is considerably above the standard of graduation of any medical college in this country or on this continent.

A blank form of the standard of acquirements in the U. S. Army, for the position of assistant surgeon of regular and volunteer staff officers is appended. The similar form used in the examinations for the U. S. Navy accompanies that for the army.

Besides the plan of Dr. Bartles, that of Dr. Hibbard deserves notice. It assumes the right to exist in the executive of a State to license medical practitioners, and proposes to delegate this power to a new body to be called a College of Guardians of Health, whose members are to be selected from the most accomplished medical men of the State, and shall organize the institution to become incorporated by law.

And this body shall, after the due examination of candidates, grant degrees which shall be *de facto* licenses to practise.

Without this license no one shall be capable of practising within the State limits; and the possession of this license or diploma will be to the people a criterion whereby they may distinguish the properly qualified physician.

Dr. Hibbard's plan, designed only for the State of Indiana, in the main is a good one, but it is perhaps too complicated; there is not required a new college to regulate old ones, nor is there required another degree. What is chiefly desired is the active interference of every State in the matter of medical practice, so as to prevent those who possess a medical degree, no matter how acquired, from practising within the limits of said State, without having previously exhibited satisfactory proof of due acquaintance with the art. This can be accomplished by subjecting the candidate to a truly practical examination in which the oral portion should occupy the least time.

The examinations should be not merely to ascertain the candidate's knowledge of the literary portion of his profession and the theory of the art, but by a practical trial in the wards of a hospital, and by surgical operations upon the cadaver, involving the ligature of arteries and the performance of amputations to ascertain the actual fitness of the candidate for the active duties of the medical profession. There should be no distinction in education between

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the physician and the surgeon, and on entrance into professional life the eleve should be required to exhibit a high degree of anatomical knowledge, and of skill in operative medicine.

The examination might occupy several days, as in the military and naval medical examinations, which, indeed, are good guides for testing medical fitness.

But no matter how conducted, the information sought for should be chiefly that needed in practice, and should therefore be eminently practical, and proved by trials at the bedside and the operating room, and other than such tests ought not to satisfy the licensing board; for it is here that all colleges fail, by conducting examinations merely verbal, which can never really test the qualifications of a candidate.

And as practical knowledge and skill is the one thing needful, your Committee are of the opinion that such licensing bodies should not, in their tests applied to candidates, embarrass their action by noting where or how the education was obtained, whether wholly by preceptor, wholly by the school and hospital, or perhaps without any extrinsic aid. The example of the University of London, and of all examining boards for public medical service, both at home and abroad, is adduced here to show how beneficially the system of examination works which inquires only into the actual knowledge possessed, and leaves it to the choice and free will of the applicant to obtain it when, where, and how he may choose or be compelled to adopt. This is where the free trade in medicine ought to be allowed full play.

With regard to the constitution of the State board for licensing medical practitioners, your Committee are of opinion that this examination should be conducted by physicians and surgeons appointed by the State (in large cities where there is a college of pharmacy one member of it should be added) from among the profession, and in such a manner as to avoid appointment by favoritism as a political reward, or for any other reason than for educational merit alone.

Wherever a State medical society exists one-half of the Board might with advantage be chosen as members out of it—otherwise the most prominent medical men of the State, and preferably those connected with hospitals.

These appointees ought to form a committee of medical censors who would receive pay for their services, which amount might be reimbursed to the State by fees charged on licenses obtained.

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This commission should meet as often as required for the examination of candidates for license; and while the law should render it compulsory that each person practising in a State should possess this license, it should enact some ready method of bringing parties acting in neglect or contempt of this law to immediate penalty by fine. This power might be vested in the commission.

It has been proposed in a former report that the American Medical Association should be the institution and power which should alike determine the nature and extent of the medical acquirements in an American practitioner—and grant the privilege to practise; but there are many and grave objections to the adoption of such a proposal.

The American Medical Association being a self-constituted body, a voluntary association, has no powers to act—nor would it be desirable that the control even in medical education should be vested in it. It has been hitherto purely an advisory body, and if it desires to continue to express the voice of an united and unanimous profession, it will be cautious of assuming any privileges or functions hitherto exercised, whether rightly or not, by corporate bodies.

Your Committee believe that the spirit of the age is not favorable to the augmentation of the power of colleges or the multiplication of degrees, and, therefore, that it would form no proper function of this Association to do other than by recommendations to point out the way in which instruction may be enlarged, rendered more directly useful or more attainable, and that this is to be accomplished both by addressing the colleges and schools on the one hand, and the medical profession as represented by the medical societies of the several States on the other, requesting them to work hand in hand to this good end—the former by enlarging the curriculum of education and affording ample facility for full instruction in all branches, and the latter by establishing the board for examiners and licensing all practitioners who design to practise within the territorial limits. In order, therefore, to meet the foregoing requirements and place medical education on the highest basis, that is, liberty to any one to acquire the information and carry on the study wherever found to be most desirable, it will be necessary that the Executive Government of each State should pass an act regulating the practice of physic upon the following basis, *i. e.*:—

That the possession of a degree in medicine is not evidence of

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the right to practise. That the right to practise medicine in a State belongs to that State, who should appoint a Board of Examiners, who should be the licensing body, and who should grant certificates, as licenses to practise within the limits of said State.

It has been stated that this proposed plan would excite great opposition from the medical colleges and schools who at present grant degrees which carry with them the admitted practice of the art.

But if it be considered that the possession of a degree of medicine is nowhere outside of the United States conceded to give a right to practise medicine—then the removal of this privilege would only place these colleges in a position similar to such educational establishments elsewhere in the civilized world.

A collegiate medical degree in Europe does not confer the liberty to practise; the authority for such license is vested in the executive of the State, who, either through its Medical Director, Medical Committee, Academy of Medicine, or General Registration Office, exercises this privilege and grants licenses to medical men, properly qualified to settle and practise in a locality.

The power to grant a license to practise medicine in a State is originally vested in that State, and is not inherent in any medical educational establishment.

As medical colleges have no actual power to license, being only legally authorized to grant certificates of competent education, *i. e.*, degrees upon the possession of which a license to practise may subsequently be granted, it is in no way interfering with any of the inherent rights of these corporate bodies for the State to assume the right to take care of the health of the community by examining and licensing practitioners.

The colleges would after such action still exercise their right to grant degrees, and there would be no pecuniary interest damaged, since the education of students would still be conducted in colleges as heretofore, and degrees would be sought for and granted as usual; for the student has at this present time, in the majority of cases, no other mode of obtaining a knowledge of the various departments of science which constitute medicine than by attendance on the lectures and demonstrations in a medical school; and will always preferably go to a medical school for information, even on subjects akin to practical medicine which might be learned from books; and having studied in the school will take a degree from

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the institution as a certificate of a complete collegiate education, and *nothing more.*

Your Committee would, therefore, recommend the Association to place itself in communication (through the various medical societies) with the State executive in every one of the States represented in this Association, and endeavor to have a law passed bringing the licensing of physicians and surgeons within the domain of the several legislatures, by the formation of examining boards of capable and zealous members of the profession, who, after due practical examinations of each candidate, will grant to those entitled to the same a certificate licensing them to practise medicine in all its branches.

While this would not interfere with the privileges of colleges and medical schools, it would secure an efficient and well-educated class of practitioners, who would be in no way restricted as to the locality where, or the order and manner in which their education had been obtained, and it would also, in the eyes of the Committee, be the best safeguard to the profession that no illiterate or unworthy member was among them, and would deal a heavier blow against quackery than all the idle diatribes of our members, who, either in derision or anger, shoot their blunted arrows against the public armor of triple ignorance.

Your Committee, having now completed their labors by submitting this report, ask leave to be discharged from the further consideration of the subject.

Respectfully submitted.

THOMAS ANTISELL, M. D.,
Chairman.

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Synopsis of Education in American Medical Schools, 1865.

Number.	Names of Medical Colleges.	Location.	Number of Matriculants.	Number of Graduates.	Length of Session—Months.	Number of Courses in the Year.	Number of Professors.	Subjects Taught.																							Remarks.
								Anatomy.	Physiology.	Theo. and Practice of Medicine.	Surgery.	Military Surgery.	Hygiene.	Materia Medica.	Chemistry.	Forensic Medicine.	Comparative Anatomy or Elements of Histology.	Botany.	Practical Chemistry.	Microscopy.	Ophthalmic and Aural Surgery.	Cutaneous Diseases.	Dissections required.	Dissections recommended.	Hosp. Attendance required.	Hosp. Attendance recommended.	Obstetrics and Diseases of Women and Children.	Clin. Med. and Path. Anatomy.			
1	Albany Medical College.	Albany, N. Y.	99	45	4	1	6	"	"*	"	"	0	0	"*	"*	"*	0	0	0	0	0	0	"	0	0	0	"	0	Diploma confers the right to practise.
2	Buffalo Medical College.	Buffalo, N. Y.	120	51	4	1	7	"	"*	"	"	0	0	"*	"*	"*	0	0	0	0	0	0	"	0	0	0	"		"
3	Bellevue Hosp. Med. College.	New York.	323	111	4½	1	13	"*	"*	"	"	0	0	"	"	0	0	0	0	"*	0	0	"	0	"	0	"		"
4	Berkshire Medical College.	Pittsfield, Mass.			4	1	8	"*	"*	"	"	"	"*	"*	"		0	0	0	0	0	0					"		No return from this college. (Information obtained from Med. Journ.)
5	Dartmouth College.	Hanover, N. H.	48	20	3	1	8	"*	"*	"	"*	0	0	"	0	"	0	0	0	0	0	0	0	0	0	0	"*		No qualifications required. (1864.)
6	Med. Dept. Georgetown Col.	D. C.	84	20	4½	1	7	"	"*	"	"*	"*	"*	"	0	0	0	0	0	0	0	0	0	0	0	0	"		Diploma confers no right to practise.
7	Harvard University.	Boston, Mass.	244	54	4	3	10	"	"	"	"	0	0	"	"	"*	0	0	0	0	0	0	0	"	0	"	"*		" " " "
8	Jefferson Medical College.	Philadelphia, Pa.	386	136	5	1	6	"	"	"	"	0	0	"	"	"	0	0	0	0	0	0					"		Diploma is not required.
9	Long Island Col. Hospital.	Brooklyn, N. Y.				1	9	"	"*	"	"*	"*	"*	"	"	"	0	0	0	0	"*	0					"		
10	Medical School of Maine.	Brunswick, Me.	98	26	4	1	7	"*	"*	"	"	0	0	"	"	"	0	0	0	0	0	0					"		Diploma confers the right to practise.
11	Med. Dept. Univ. Michigan.	Ann Arbor, Mich.	417	70	6	1	7	"*	"*	"*	"	0	"*	"	"	0	0	0	0	0	0	0	"	0	"	0	"		" " " "
12	Med. Dept. Univ. Nashville.	Nashville, Tenn.	65	27		1	7	"*	"*	"	"	"*	0	"*	"	"*	0	0	0	0	0	0	"	0	"	0	"		" " " "
13	University of New York.	New York.	223	62	4½	2	7	"	"*	"	"*	"*	"*	"	"*														" " " "
14	New York Medical College.	New York.	67	16	6	2	12	"	"	"	"*	"*	0	"	"	"	0	0	0	"	"	0	"	0	"	0	"		" " " "
15	Medical College of Ohio.	Cincinnati, Ohio.				1	7	"	"	"	"	0	0	"	"	0	0	0	0	0	0	0					"		No return from this college. (Information obtained from Med. Journ.)
16	University of Pennsylvania.	Philadelphia, Pa.	414	117	5	1	7	"	"	"	"	0	0	"	"	0	0	0	0	0	0	0					"		
17	Rush Medical College.	Chicago, Ill.	293	108	4	1	8	"	"	"	"	0	0	"*	"*	"*	0	0	0	0	"*	0	"	0	"	0	"		Diploma confers the right to practise.
18	Starling Medical College.	Columbus, Ohio.	72	32	4½	2	6	"*	"*	"	"*	0	0	"*	"	"*	0	0	0	0	0	0	"	0	"	0	"		No qualifications required.
19	Medical College of St. Louis.	St. Louis, Mo.	183	57	5	1	7	"	"*	"	"	0	0	"	"	"*	0	0	0	0	0	0	"	0	"	0	"	"	" " " "
20	University of East Tenn.																												No medical department.
21	Med. Dept. Univ. Vermont.	Burlington, Vt.	89	31	4	1	10	"	"	"*	"	0	"	"*	"	"	0	0	0	0	0	0	"	0	0	0	"		
22	Yale Medical Institution.	New Haven, Conn.	45	18	4	1	6	"	"	"	"	0	0	"	"	"	0	0	0	"	0	0	0	"	0	0	"		Diploma confers the right to practise.

Note.—(") Two Commas mean "yes." (0) A Cipher means "No." (*) The Asterisk denotes that another subject is taught in the same course.

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Merit Roll of Candidates examined by the Army Medical Board convened in the City of on the day of 186

REGULAR ARMY.

No.	NAMES. Surname.	NAMES. Christian Name.	NATIVITY.	RESIDENCE.	AGE.	PHYSICAL QUALIFICATIONS.		MAXIMUM	100	100	100	100	100	100	100	80	80	80	80	50	1070	POSITIVE MERIT.		RELATIVE MERIT.	REMARKS.
						Married.	Single.	MINIMUM	80	80	80	80	80	80	80	50	50	50	50	30	790	Approved.	Rejected.	No.	
					From 21 to 28 years.				General Aptitude.	Literary and Scientific Qualifications.	Hygiene.	Anatomy.	Physiology.	Surgery.	Practice of Medicine.	General Pathology and Pathological Anatomy.	Materia Medica and Therapeutics.	Medical Jurisprudence and Toxicology	Chemistry.	Obstetrics and Diseases of Women and Children.	Aggregate.				Diploma not required.
					Above 21 years.	No inquiry made.			80 / 60	80 / 60	80 / 60	80 / 60	80 / 60	80 / 60	80 / 60	No inquiry made.	60 / 40	60 / 40	60 / 40	No inquiry made.	740 / 540				Length of Examination one (1) week. Diploma required.
					From 21 to 28 years.	No inquiry made.			100 / 80	No inquiry made.	No inquiry made.	100 / 80	100 / 80	100 / 80	100 / 80	100 / 80	100 / 50	40 / 20	100 / 50	40 / 20	780 / 540				Length of Examination two (2) weeks. Diploma not required. Thesis required.

* *Information for Persons desiring to enter the Corps of Volunteer Surgeons.*—All candidates for appointments in the above Corps must be examined before a Board of Medical Officers convened at such time and place as the Surgeon-General may direct.

Applications for appointments must be made to the Surgeon-General or Adjutant-General of the army in the handwriting of the applicants, accompanied by one or more testimonials from respectable persons in regard to moral character.

Examinations will be for the grade of Assistant Surgeons only, and no one under twenty-one years of age will be examined.

Promotion to the grade of Surgeon will be made by selection from the Assistant Surgeons on the ground of merit and faithful performance of duty.

SURGEON-GENERAL'S OFFICE, May 27, 1863.

WILLIAM A. HAMMOND.

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REPORT

ON

AMERICAN MEDICAL NECROLOGY.

BY

CHRISTOPHER C. COX, M. D.,
OF MARYLAND.

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REPORT ON AMERICAN MEDICAL NECROLOGY.

AT a former meeting of the Association, the Committee on Necrology, the duties of which had been previously performed exclusively by the chairman, was enlarged, at his suggestion, so as to embrace one member from each State, thus affording promise of more extended and careful contributions to the mortuary archives. I regret to state that the expectation of assistance from these sources has, to a great extent, failed. With few exceptions, entitled to honorable mention, little interest has been thus far indicated by the members of the Committee in the object of their appointment. Notwithstanding frequent communications addressed to the various gentlemen composing the committee, the responses have been few, and for the most part unsatisfactory. I have neither comment nor complaint to offer, but simply to express the hope that in the future construction of the Committee, should it be continued, the selection of its members may be confined to those who feel sufficient interest to discharge promptly the duty assigned them.

With this inadequate supply of information from the Northern and Western States, there comes as yet no utterance from those of the South. For four years her voice has been sealed. Many of the profession have doubtless passed away under the skies of that unhappy and distracted land, but no record of them has ever reached us. Thank God for the triumph of our arms, which has thrown wide open the golden gates of peace, and admitted once more to our brotherhood those who have been so long separated from us!

MAINE.

But one death has been reported from this State—that of Dr. W. H. ALLEN, of Orono. He was born at Farmington, Maine, and graduated with honor at the Medical School of his native State, after attending lectures during a part of his term in Boston and Brunswick. Early in the war he went out as a regimental surgeon; was

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captured, and confined at Richmond, suffering much from the privations and horrors of prison life. Upon his release he resumed the practice at home. A second time he went forth to hospital duty at Washington, where he continued to labor until, utterly broken in health, he sought once more his northern home to die. His death took place at Orono, in the 57th year of his age.

Dr. J. T. Dana, in his annual address before the Maine Medical Association, remarks:—

"He was a man of strict integrity, of strong head and warm heart; one who earnestly loved truth and right as he understood them, and cordially hated all meanness and dishonesty. As a man, he commanded the warmest affection of his friends, and the entire respect and confidence of the community in which he lived. As a physician and surgeon, he attained to great eminence, and was equally esteemed by the people and the profession."

MASSACHUSETTS.

The first record here is that of GEORGE HAYWARD, M.D., a surgeon of much repute, who died in Boston, Oct. 7, 1863.

He was first chosen assistant surgeon of the Massachusetts General Hospital in 1826; junior surgeon in 1830, and chief in in 1838. It is to be regretted that the sketch of Dr. Hayward is so meagre. He was a surgeon of rare ability, and was the author of a book entitled *Surgical Reports and Miscellaneous Papers on Medical Subjects*, Boston, 1855.

Dr. JOHN C. DALTON, an eminent and useful member of this Association, died at Lowell in January, 1864. Thoroughly trained in his profession, of large attainments, an able practitioner, he excelled quite as much in those genial qualities of the heart, that unbending Christian integrity and high sense of honor, which all good men admire. His own intimate friend, Dr. Reynolds, thus spoke of him before the Suffolk District Medical Society, on 30th January, 1864, less than a month after his decease.

"I have known him intimately forty long years, and I now look in vain for any stain upon him that I would wipe away. He was in all the relations of life conscientious, faithful, just, generous, and true; warm-hearted and sincere; remarkably free from every jealousy, evil speaking, and all uncharitableness.

"He seems to me an unambitious man, except for the faithful

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performance of every duty; very unselfish, honorable, as mindful always of the rights of others as his own. He was modest and humble, appreciating readily the merits of others, and seemingly unconscious of his own. He was loving, and so, beloved; confiding, and therefore confided in; feeling no enmity, he had no enemies. His standard for imitation was very high—the Law of God and the Sermon on the Mount; his daily regret—the impossibility of rising up to its pure demands; and, with all this, there was a certain charm about his fine intelligent face, his honest smile, his gentlemanly bearing, and the genial pressure of his hand, that seemed at a first interview to make every man his friend."

An address upon the death of this eminent physician was pronounced by Dr. John C. Green before the Middlesex District Medical Society.

Dr. JOHN C. WARE, son of Rev. Henry and Mary Ware, was born in Hingham, Mass., 19th of Dec. 1795, and died of paralysis on the 29th of April, 1864, having filled the measure of a useful professional life. He graduated as a Bachelor of Arts in 1813, and in 1816 as a Doctor of Medicine. The largest period of his practice was passed in Boston, where he resided at the time of his death, engaged in a full and lucrative business. In 1832, he was appointed Professor of Theory and Practice of Medicine in the Medical Department of Harvard College, and continued to teach in that institution until 1858. He published essays on Croup, Delirium Tremens, Hæmoptysis, as also a volume entitled *Philosophy of Natural History*, and a memoir of Dr. Henry Ware, Jr. His professional standing was of the highest order. He was a thoughtful student of science, and possessed of untiring energy and industry in the application of its truths.

At a meeting of the Suffolk District Medical Society, held April 30, 1864, among other admirable allusions to the medical standing and private virtues of Dr. Ware, a brief speech of Dr. Bigelow is perhaps the best analysis extant of the character of this great and good physician.

"Commencing life," says the doctor, "as an obscure professional student and practitioner in a somewhat humble part of the city, struggling for many years against difficulties, silently building the solid platform which was to sustain his future eminence, he at length became a man whom society needed, and whose claims and services it was not slow to recognize. He became a writer, a

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teacher, and for many years an extensive and laborious practitioner, and when at length his impaired health compelled him to forego a large part of his ordinary duties, he found in country retirement, in philosophic studies, in theological inquiries, and in the intercourse of his many friends, a solace congenial to his placid, unaspiring, rational, and truth-loving character."

* * * * * * * * *

"During a lifetime which considerably exceeded the average duration of human existence, he followed with unwavering devotion the path of conscientious duty. His kindly nature forbade him to speak ill even of those who crossed his path, and I do not know that he had an enemy.

"The benignity of his temper, the impartiality of his reasoning, the clearness of his perception, the justice of his inferences, and the attractive language in which he conveyed his thoughts, caused his presence to be welcomed by the sick and his counsel to be sought and respected by his professional brethren.

"His opinions on medical subjects are well known. Vindicating the power of his science for good, but deprecating its too frequent *perversion* for evil, he pursued the independent path of professional rectitude, and guarding alike against unsound influences and impulsive and hasty generalizations, he subordinated to the welfare of the patient, the self-love of the practitioner. He did not claim infallibility for his art, nor impute to his own exaggerated skill the inevitable processes of nature. With the frankness and humility which indicate a strong and self-reliant mind, he watched and guarded, but never recklessly thwarted, the restorative influences inherent in the unmolested constitution."

Dr. WILLIAM EDWARD COALE was born in Baltimore, Md., on 7th January, 1816, and died in Boston, after a short illness, 24th April, 1865.

He was a student of medicine in the office of Dr. Eli Geddings, now of Charleston, then a Professor of Anatomy and Physiology in the University of Maryland.

In 1837, he entered the navy as Assistant Surgeon, receiving a very high grade in a large and talented class of candidates. In 1842, after an extensive cruise in the frigate Columbia, he was placed on duty as Surgeon in the Charleston Navy Yard, and in the following year he relinquished the sea, and commenced the practice of his profession in Boston. Deeply trained in the science

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of his choice, ardent in the pursuit of knowledge, social and genial in his intercourse, with a cultivated taste for letters and the arts, benevolent and kind to all who came within the sphere of his ministrations, he continued to practise with great acceptance and success for a number of years.

In the summer of 1862, he served on the Peninsula, and upon government transports, with great zeal and success, and to the extraordinary exposure and fatigue to which he was subjected, may be attributed much of the bad health which afflicted him for a year or more preceding his death.

In the autumn of 1862, he was appointed to inspect the western hospitals, and discharged the duty assigned him with his usual ability and promptness, presenting a valuable report of his labors.

In 1852, he published a small volume, which had an extensive circulation, entitled "Hints on Health," and in 1862 an essay on "Aneurism," marked by much research and skill. His essay on "Fractures" secured the Fiske Fund prize.

Dr. Fitch Edward Oliver, of Boston, in a letter to the author of this report, remarks:—

"He held many offices of high trust in the Massachusetts Medical Society, and was appointed as the Anniversary Chairman of the annual meeting of the present year. He received a few years since the honorary degree of Master of Arts from Trinity College, Hartford, and certainly such an honor was never more worthily bestowed.

"A man of remarkable mental vigor, a memory unsurpassed in strength, he had few equals in the variety and extent of the information he had acquired.

"He wrote much and well on many subjects, and it is to be regretted that so little has been vouchsafed to the public."

Dr. LYMAN BARTLETT died in Boston, on 6th of June, 1865.

Dr. Joseph Sargent, of Worcester, thus refers to this physician: "The first day of our meeting (American Medical Association) in Boston was saddened to many of the Association by the announcement of the sudden death of Dr. Lyman Bartlett, of New Bedford, Massachusetts, who died on 6th of June, 1865, a little before noon.

"Dr. Bartlett had been one of the Association from the earliest history of its organization, and it was one of his last solicitudes that the hospitalities of the meeting to which he wished to contribute, should be generously dispensed.

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"Dr. Bartlett was born in Conway, Massachusetts, November 21, 1807, and was 57 years of age at his decease. His medical education was chiefly under Drs. J. C. Warren and George Hayward, of Boston, and Dr. Willard Parker, now of New York: and his relations with these gentlemen were always marked by the highest mutual respect.

"He commenced practice in New Bedford in the year 1835, and after four years of fatiguing service went to Europe. After nearly two years of attendance upon the hospitals in Paris and London he returned to New Bedford to occupy a very prominent position in all that part of Massachusetts as a physician and surgeon. He was respected and beloved by the community, and highly esteemed by his associates for his sound judgment and extensive experience. His large practice left him little leisure for even professional writing, and he was known and will be recollected for his works and not for his words. He was a good physician and a high-minded Christian gentleman.

"He had suffered for a year and more with dyspepsia, and was found, on post-mortem examination, to have a scirrhous pancreas with a large cancerous mass in the liver. The last occupied the middle lobe of the liver, which had contracted adhesions with the stomach to the right of the cardiac orifice. In the midst of the tumor was a cavity filled with blood and coagula, which communicated with the stomach by ulceration near the cardiac orifice. The stomach was also entirely filled with coagula, the walls of the stomach however remaining entirely healthy except for the thickening involved in the adhesions. The hemorrhage consequent upon the rupture into the stomach explained the sudden death, the patient having had a good appetite and little dyspepsia for some weeks prior to the fatal termination."

RHODE ISLAND.

The following memoirs were kindly furnished by the venerable and distinguished Dr. Usher Parsons relating to eminent members of the profession in Rhode Island who have passed away since the last meeting.

Dr. Jervis Johnson Smith was born Feb. 18, 1801, in what is now the town of Burrillville, though then included in Gloucester. He received his preparatory education in the Quaker School of Rhode Island and under a private tutor. His medical studies

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were pursued under Dr. Warren H. Smith, of Burrillville, and at the New Haven Medical School, where he graduated in 1827. After two years spent in Burrillville he removed to Gloucester, where he practised till his death. He was elected a Fellow of the Rhode Island Medical Society in 1834, was one of the censors from 1850 to 1855, was elected second vice-president from 1860 to 1862, and first vice president in 1863, which office he held till the day of his death, March, 1864.

During the first week in February, he was attacked with diphtheria. He experienced rigors and headache and agonizing pain in the throat, which was inflamed with patches of the exudation peculiar to that disease. After three or four days, his symptoms diminished in severity, giving hopes of recovery. A few days later, he was generally worse again, with the grave complication of pleuro-pneumonia, attended with acute pain on moving or coughing, which deprived him of sleep two or three nights. It was while suffering under this aggravation of his symptoms, that Dr. Ariel Ballou was called on the first of February. He found him with tongue covered with a thick white coat, loathing all food, unable to take anything without nausea, except small pieces of ice. Dr. H. I. Bowditch, of Boston, was called on the seventeenth, who advised a sustaining course, which produced some mitigation of his sufferings, but the system soon passed into a typhoid state from which it never rallied. The disease was marked throughout by great prostration and loss of appetite. He expired on the tenth day of March, some five weeks after the attack. His mind remained clear till near the end. He was fully conscious of his danger, and met death with composure and resignation.

Dr. Smith was a large and finely made man, with thick white hair, ruddy complexion, and the aspect of robust health. The expression of his countenance was frank and agreeable. For many years his practice was large and very laborious, and performed with promptness and energy. His neighbor, Dr. Ariel Ballou, was intimate with him socially and professionally, and speaks in high terms of his talents, and of his moral and social worth, and of his arduous and faithful services.

Dr. Smith was grand master of the Rhode Island Brotherhood of Masons, it being the highest office held in the State. He was, of course, buried under marked Masonic honors and ceremonies, and in the presence of a vast concourse of mourners and lamenting

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friends, who had experienced his valuable services in the sick room.

He leaves, as his family, a widow and a married daughter and her infant son.

Obituary notices of deceased members of the Rhode Island Medical Society in the year preceding the first of June, 1864.

1. Dr. EZEKIEL FOWLER was born in Worcester, Massachusetts, May, 1787; he received his preparatory education in Worcester and Leicester, and studied medicine with Dr. Mowry, of Smithfield, and Dr. John Greene, of Worcester. In 1812 he was examined before the Censors of the Massachusetts Medical Society, and received a license to practise medicine; medical degrees were less often conferred then than now. He began to practise about half a century ago in the town of Smithfield, and after many years removed to Globe village near Woonsocket, where he passed the remainder of his days. For many years he had an extensive practice. He rather favored the heroic mode of treating disease, and placed great reliance on emetics, calomel, and antimony, and made free use of the lancet.

Dr. Fowler was admitted a Fellow of the Rhode Island Medical Society in 1818. He read a discourse before it in 1836, on the treatment of febrile diseases. In 1837, he was elected vice-president for three years. Although, in his latter years, he had partially withdrawn from active practice, yet he retained an interest in his profession and in the members of it until his death, attending all the annual meetings, and nearly all those of the American Medical Association.

His well-known prudence and integrity incited the public to engage him in responsible situations, as bank director and many years its president, and placed him in the State Legislature as a senator, and trustee and president of the savings bank.

Dr. Fowler's health was declining for several months before his death. His wife died a few months before, leaving no children. He gradually sank under protracted bronchitis and senile debility, July 21, 1863, at the ripe age of seventy-six years. His memory was honored by his fellow-citizens, particularly by the institutions with which he was connected or presided over, by resolutions printed in the journals of the day, and by a general attendance at his funeral, which was conducted by the Society of Friends, with whom he was wont to worship.

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He left no immediate relations but some collateral branches, for whom he provided liberally in his will, and extended his beneficence to the Rhode Island Hospital, lately incorporated, leaving it his library, and also a bequest of bank and other stocks to a large amount, nearly seven thousand dollars.

Dr. Fowler was a man of genuine truth of character and of incorruptible integrity—commanding the entire confidence of the community in which he lived. He was kind and benevolent to the poor. In his friendships, he was warm and inflexible: and, in truth, in his prejudices nearly in the same ratio. He was simple and frugal in his tastes, old fashioned, quaint and quiet, but genial in his manners. He is remembered by most of the members of this Association as an old gentleman somewhat stooping, whose gray hairs, blue coat with brass buttons, white hat, and cane, were always looked for, and always welcome at our meetings, and as we come together year after year, it will be long ere we shall cease to miss him.

2. Dr. HIRAM ALLEN was born in Franklin, Massachusetts, in the year 1803. His preparatory education was limited. He studied medicine with Dr. Daniel Thurber, of Mendon, Massachusetts, and also at the medical school then connected with Brown University, under the instruction of Drs. S. Drown, Levi Wheaton, John De Wolf, and Usher Parsons, graduated in 1825, and in the same year settled at Woonsocket Falls, then a small village. Being the first physician in the place, he grew up with it to its present large population, and was the leading physician within ten miles' circuit.

Dr. Allen joined the Rhode Island Medical Society in 1832, and was an active member at its meetings. He was corresponding secretary of the Society for many years, and vice-president and president.

It was he that introduced, in 1849, the resolution in accordance with which these obituaries are prepared, making it the duty of the secretaries to present, at every annual meeting, notices of those Fellows and Honorary members who are known to have died during the year preceding.

He read before the Society, at its annual meeting in 1850, an interesting paper on the diagnostic marks of a still-born twin at the sixth month of gestation, the other remaining till the end of the ninth month, and born alive with the dead one. This paper was copied into several European journals.

About two years ago, it became manifest that his health and

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strength were failing. Loss of appetite, chronic diarrhœa, ascites, and anasarca, with progressive emaciation, were the chief symptoms, which gradually increased. He was three times relieved by tapping. He died on the 15th of March, 1864. A very hurried post-mortem revealed a scirrhous spleen that weighed twenty-eight ounces. The other abdominal organs appeared normal; the thorax was not examined. The body was much emaciated.

Dr. Allen was widely known and a popular physician, was of sound judgment and modest demeanor. We will quote from the remarks of those who were best acquainted with him. "Both day and night," says a writer in the *Patriot* in his town, "he was at the call of the public, and what was peculiar and praiseworthy, he went as promptly at that of the poor as of the wealthy. Few men could have withstood such a constant strain of the physical and mental faculties. His herculean frame, iron constitution, and happy temperament, bore him up, and he accomplished an incredible amount of service. His presence in the sick room was always a solace, he was so cheerful, pleasant, and sympathizing.

"He was an active and useful citizen. For twenty-five years he was a director in the Woonsocket Falls Bank; and for several years past a warm friend and liberal helper, and finally director of the New York and Boston Railroad Company. The board of this company passed resolutions concerning his death, in which he is characterized as the able, humane, and devoted physician, and the unobtrusive and noble man, distinguished by his kindness, truth, and purity; a man of solid judgment, wise counsel, eminent probity, and beneficent life."

He leaves a widow, but no children.

The foregoing members of this Society were men of ability and character. All of them have been married, yet none of them leaves a son, and but one of them, Dr. Smith, a daughter.[1]

CONNECTICUT.

Among the dead of this noble State will be recorded the death of two of the greatest and best men who have adorned the profession of medicine. The names of Jonathan Knight and Benjamin Silliman are the common property of those who honor science in

[1] The writer is indebted to Dr. J. L. Ray, Secretary of the Rhode Island Medical Society, for most of the material of the foregoing sketches.

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its highest manifestations, blended with incorruptible integrity and exemplary Christian virtues and graces.

Dr. JONATHAN KNIGHT was born in Norwalk, Connecticut, and died, in New Haven, August 25, 1864, in the 76th year of his age.

I copy a sketch from the pen of Dr. Worthington Hooker, the associate of Dr. Knight in the Medical Department of Yale College, whose intimate knowledge of the deceased eminently qualifies him for the task.

Jonathan Knight, M. D., was born in Norwalk, Connecticut, September 4, 1789, and died August 25, 1864. His father was a physician, and so also was his grandfather on the mother's side. At the age of fifteen he entered Yale College. After his graduation he had charge of an academy in Norwich for two years, and then was appointed tutor in the college. While he officiated in this capacity he pursued his medical studies. At this time the plan of a medical institution in connection with the college was determined upon, the celebrated Dr. Nathan Smith, who was then in the fulness of his fame as a practitioner of both medicine and surgery, being designated as one of its professors. Mr. Silliman was then professor of chemistry in the college, and he suggested, as he stated to the writer of this notice in a conversation the day before his death, that young Knight, then only twenty-one years of age, had all the qualifications necessary to make a good professor of anatomy, after due preparation for the work. The suggestion was followed out, and to effect this preparation, Dr. Knight spent the winters of 1811 and 1812 in attendance on lectures and in prosecuting dissections in Philadelphia.

In 1813, the medical institution was organized, and Dr. Knight occupied the chair of anatomy and physiology till 1838, when on the death of Dr. Thomas Hubbard, he was transferred to the chair of surgery, which he filled to the last year of his life.

It was a great gratification to the friends of Dr. Knight in his advanced age, that his mental activity was entirely unimpaired, and that he was able to attend fully to the duties of his profession up to his last sickness. Those who heard his last course of lectures saw no abatement of his usual mental vigor and freshness.[1]

[1] Dr. Knight died of peritonitis produced by stricture of the rectum, as was shown by the fact that the traces of inflammation were strongest in the neighborhood of that difficulty. The stricture was at a point about one-third of the length of the rectum from the colon. The intestine was much thickened at that

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Dr. Knight was eminently successful both as a practitioner and a teacher, and it will be profitable to consider the mental and moral qualities which were the foundation of this success.

He was but to a small extent an originator, and was not generally adventurous either in thought or in action; and yet he was not at all inclined to routine, but was an active and independent thinker. His opinions were his own, and he was no retailer of the views of others. He was a conservative in the best sense of that term, being very sure not to lose hold of established truths in the pursuit of glittering novelties; settled principles and ascertained facts, had a sort of sacredness with him in comparison with suppositions, however plausible they might be, and he applied to every new doctrine or statement the most searching tests. He had extraordinary mental clearness, and all his knowledge was set in order in his mind. Good sense, in its largest and highest meaning, was his most prominent characteristic, resulting from a beautiful balance of his mental powers. Perhaps some, who have a fondness for bold views and adventurous thought, would say of him, as was said for similar reasons of Washington, that he had no genius; but in either case the aggregate of mental force was great, and produced great results—the greater for the harmonious adjustment of the elements of that force, and the moral power which always presided over its action. This moral element was very conspicuous in Dr. Knight. It was not merely enhanced by religious principle, but was based upon it. It gave a calm dignity and a mild *radiance*—no other word so well expresses it—to the influence which he exerted upon the opinions and feelings of others. His personal appearance and manner had much to do with this influence—so much, that we may say, that any one of ordinary sagacity would on first seeing him get a correct impression of his mental and moral character. There was in him an uncommon correspondence between the outer and the inner man.

Possessed of these qualities, it is not to be wondered at that he should have won so largely the confidence of the community as a practitioner. His conclusions came with authority to both patient

point, and the passage was too narrow to admit the little finger. It was undoubtedly from the gradual production of this stricture that Dr. Knight was entirely dependent on medicine for the evacuation of his bowels for a long series of years before his death. From some indications at the beginning of his sickness, which was of about ten days' continuance, it is supposed that the gout, from which he occasionally suffered, had something to do with the attack.

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and physician, though no man was farther than he from the assumption of authority. Though he held so exalted a position as counsellor, he was never tempted into any improper exercise of power, or any display which should dazzle the public eye. He wore his honors modestly. His practice as a surgeon was eminently conservative. There is a glitter of the surgeon's knife, as well as of the sword, tempting to rash acts, but it had no attractions for him.

Perhaps there has been no man in the profession who was a more thorough student through life than Dr. Knight. Especially was he familiar with the literature of surgery, and he was, therefore, often able to refer some vaunted new improvement or doctrine to a prototype in the past, sometimes not merely resembling the supposed novelty, but identical with it. It is to be remarked here, that his reading was by no means restricted to medicine, but took a wide range, even embracing the lighter literature of the day, the selection, however, in this case being a very strict one. He had, therefore, none of that narrowness of intellect which inevitably results from a confinement to purely professional channels; but there were broadness of view and richness of comparison and illustration in all his mental efforts. This extensive literary culture also contributed much to that power of expression which so distinguished him both in conversation and public speaking.

The qualities which have been depicted were all brought out prominently in the performance of his duties as a lecturer. His thoughts had a transparent clearness, and were arranged in just the order best fitted to enter the minds of his pupils; his language had a terseness and elegant simplicity rarely equalled; his comparisons and illustrations were exactly adapted to the points aimed at; and his descriptions were so graphic, that it was actually like seeing the things that were described. But there were even higher elements of success than these. The hearer was impressed with a sense of the completeness of the lecturer's knowledge of the subject, and with his love of the exact truth even in minute matters. And besides this, his mind was wholly absorbed with the subject in hand, giving him an enthusiasm which did not fail to be communicated to the audience. The manner of the man, too, was an essential part of the lecture, so much so that no report of it, however full and accurate, could give anything like an adequate idea of it to one who had never heard him. The effect produced upon the audience was the result of a combination of influences harmoniously co-operating. Matter, style, person, voice, manner, and we

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may add character, all contributed, and each in its proper way. And here we have the explanation of the fact that none of his few published efforts exhibit that consummate power which he had as a lecturer. Some of the elements are absent that are necessary for the full effect. The man is not there, and the audience is not there from whose presence he received some of his inspiration.

From what has been said, it is readily seen how Dr. Knight to so great an extent moulded the minds of his pupils. He has in this way exerted a vast influence in his fifty years of labor as a professor, upon the character of the general medical mind of this country.

Dr. Knight was naturally a diffident man, and experienced much embarrassment from this source (as some of his early pupils testify) in the first part of his career as a lecturer. He told the writer of this notice that at that period he, on several occasions, walked off into the fields, to be far away at the hour of lecture, from reluctance to meet his class. Even of late years, signs of this diffidence have appeared, when some new and unexpected circumstances arose. If, for example, any physician chanced to appear among his auditors, he would manifestly lose some of his usual self-possession, because as he was lecturing to students, he felt that there was an incongruity between his lecture and at least one of his audience. And it was interesting to observe how he would now and then regain his composure through the absorption of his mind in the subject.

Dr. Knight was twice President of the American Medical Association, and the manner in which he presided over its deliberations was the subject of such universal admiration that he was very often chosen to preside in committee of the whole. His success in this capacity has been by some attributed chiefly to his acquaintance with parliamentary rules. But this is a mistake. He told the writer that he was, to a great extent, ignorant of those rules, and that he simply applied the plain principles of common sense in acting as a presiding officer. It was the clearness of his mind, his good sense, his calm dignity of manner, his personal appearance, all combined, that gave him his power over the assemblies of his fellow-men. Even when his decisions were technically wrong, as they sometimes were on small points, the audience had such confidence in him that those who knew so much of parliamentary rules as to see the technical failure, let it pass, because they thought it vain to resist the full tide, or they partook so much of the

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general feeling, that they were half persuaded that their own opinion was erroneous.

The same clearness of view which Dr. Knight had on ordinary subjects, he had also on the most important subject that can engage the mind of man, and through a long life he pursued the even tenor of his way with a firm faith, living as seeing him who is invisible. In his last moments, as his pastor, Dr. Bacon, spoke of salvation through Christ, he said emphatically, "I can look nowhere else. If this is not true, there is nothing true"—a declaration indicating the clearness and definiteness with which his mind was established on that subject, and, therefore, eminently fitting for the close of a life marked throughout by a love for exact and well-proved truth.

BENJAMIN SILLIMAN, M. D., LL. D., was born in Stratford, Connecticut (now Trumbull), August 8, 1779, and died in New Haven, on Thanksgiving day, November 24, 1864, at the ripe age of eighty-five years.

He entered Yale College, from which he was never to be separated save by death, in 1792, graduated in 1796, became tutor in 1799, and was appointed professor of chemistry and natural philosophy in 1804. In the course of preparation for his new chair, he became a pupil of Dr. Woodhouse, of Philadelphia, and subsequently pursued his studies under the best masters and teachers in Europe. Few more entertaining sketches have been published than the journal of this distinguished *savan*, given to the public on his return to America. Of the sciences of chemistry, mineralogy, and geology, he may almost be regarded as the father in this country. Great were the difficulties and discouragements which crowded the commencement of his labors in these departments, most gratifying and glorious the rewards which succeeded to his long-sustained work in the field of science. As a lecturer, he had few equals and no superiors. Commanding appearance, graceful delivery, sprightly illustration, uninterrupted fluency of expression, were but the drapery of profound thought, of vast and varied attainment. He had the faculty of inspiring enthusiasm in the breasts of his hearers, and many left the halls in which he discoursed, full of zeal in the investigation of the subjects so eloquently taught. With no labor of his long life will his name be more universally associated than with that of the *American Journal of Sciences*, commenced and conducted under herculean difficulties.

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"He had the sagacity to foresee, as long ago as 1818, the scope which such a magazine should take. The prospectus which he then wrote is applicable almost exactly to our pages to-day. Experience has established the wisdom of the course he marked out.

"He maintained the *Journal*, from the beginning, at his own pecuniary risk. Its publication has often been a financial burden, and in its most prosperous days has not yielded a fair return for editorial labor. But it has been continued at this personal inconvenience, for the sake of American science, that the labors of our countrymen might be made known abroad, and the labors of Europeans understood in this country.

"The *Journal* has never been used for the benefit of any party or individual, but solely for the advancement and diffusion of scientific truth. His pages have often been open to free scientific discussion, with truth as the single end in view."

Dr. Silliman was too constantly and actively at work in the lecture hall and the laboratory, to allow of any very extended scientific treatises. His contributions to geology and chemistry were not very numerous, but always important. His text-book on chemistry is still regarded as a treatise of much value to students. He also edited Henry's Chemistry and Bakewell's Geology. As a popular lecturer, no one was more admired or sought after. He was invited to the principal cities, and delivered many courses of scientific lectures to crowded and delighted audiences.

His personal character was the key to his remarkable success. "His mind," remarks President Woolsey, "was of the rhetorical, not of the analytical cast. He was a man of practical judgment, and not drawn by his native leanings into abstruse speculations; and hence he was better qualified to act directly upon mankind. His perceptions were quick, his taste good, his tact exquisite. Few men are better fitted to shine in society than he. To a most commanding person, an engaging countenance, and an admirable carriage, he united that ease and affability which are the product of self-respect and kindness united. Fond of admiration, and yet not led by it into the slightest disposition to depress others below their true level, he at once found his enjoyment in the good-will of others, and showed entire good-will toward them. He was among all the men who have lived in this city during the present century—as I think will be conceded by anybody—the most finished gentleman. And this was true of him in the highest sense. I mean that it pertained not to his exterior but to his character and his soul. It

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was founded on a high sense of honor, a delicate perception of what was due to others, and was due from them to him. His dignity of manner was not so much modelled after the old style, which the gentlemen of the days before the Revolution handed down, as it ran back into dignity of character; it proceeded from a self-valuation, which, without being assuming, takes the right place, neither depriving others of what is their due, nor being afraid to occupy a position which is fairly one's own. But the radical essential trait of his gentlemanly character was gentleness and kindness. This led him to study the pleasure, to respect the feelings of those in whose society he was placed; and this, whether they were high or low in the world. For the poor, the dependent, the young, the undistinguished—for all he had a good word; and the word was not an empty token, but the indication of the truth that lay in the heart. Hence all loved him."

A Christian in his daily walk and conversation for many years, his death, as might be expected, was quiet and undisturbed. President Woolsey, in his eloquent address upon his death, portrays the scenes of the last hour, more full of peacefulness and beauty than any we have ever known or read of. Happy in life and all its relations, he passed away with words of love and gratitude on his lips.

NEW YORK.

Dr. E. S. F. Arnold, of Yonkers, who has been ever prompt in his contributions to the necrology of the profession, furnishes the following notices, reaching to 1st of May, 1864:—

ABIJAH G. BENEDICT, M. D., of Red Hook, Dutchess Co., was the son of Benj. Benedict, a respectable farmer in Westchester Co., where he was born in 1790. He was licensed by the Dutchess Co. Medical Society, June 1, 1815. In 1818 he removed to Red Hook, where he spent forty years as an eminent practitioner as well as a prominent member of the community. He was a member of the New York Legislature in 1835 and 1836; became a permanent member of the Medical Society of the State of New York in 1838, and was President of the Dutchess Co. Medical Society in 1841. He died October 4, 1862, having retired the evening previous in accustomed health. Dr. Benedict left one son in the medical profession and one a clergyman of the Episcopal church.

ROBT. G. FRARY, M. D., was born in the city of Hudson, November 15th, 1793. Left an orphan at the age of twelve years, he had

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to rely upon his own resources. He began the study of medicine with Dr. Brewster, of Chatham, Columbia Co., closed his studies with Dr. Samuel White, of Hudson Co., was admitted to practice by the Columbia Co. Medical Society in May, 1815, and commenced his career as a medical practitioner at Canaan Four Corners. Having married Miss Lucy Warren in 1819, he removed in the spring of 1820 to Hudson, where he continued to practise for forty-two years. In 1836 he became a member of the N. Y. State Medical Society, of which he subsequently became President. He was a good physician, and might be said to have held a position in the front rank of his profession, having had no superior in Columbia County. He was always particularly prompt to attend to calls of the poor where he expected neither fee nor reward. For upwards of thirty years he filled the position of health officer of the city of Hudson, repeatedly also served as supervisor, alderman, and more than once as mayor. He died December 29th, 1862.

ARBA BLAIR, M. D., was of Scottish extraction, his great grandfather having removed from Scotland to Ireland during the early part of Cromwell's rule. His grandfather came to America, and died at Worcester, Mass., in 1796. Samuel Blair, the father of Arba, was a farmer at Warren, Mass., where the subject of the present notice was born, July 9, 1781. In 1803, he removed to Rome, N. Y.; attended lectures at Columbia College; was licensed in 1805, and in 1809 received the degree of Doctor of Medicine from the Regents of the University. He took part in the organization of the Oneida County Medical Society, and presided at the celebration of the semi-centennial anniversary. Having several times been delegate to the State Medical Society, he was voted a permanent member in 1854. He served also as an Oneida County delegate at the meeting of the American Medical Association in New Haven. He died June 20, 1863, at the age of 82, a practitioner of more than half a century.

Dr. Cobb remarks, "He came to Rome in 1803, when that village numbered scarcely 400 inhabitants. The country there, at least its northern part, was almost a wilderness. The early settlers were few, and located at points remote from each other, so that, as a natural consequence, the practice of medicine was arduous, tedious, and wearisome, far beyond what the practitioners of more modern times have any conception of. By his skill and kindness, industrious habits, and prompt attention to business, he soon won

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the confidence of the public, and this confidence he continued to enjoy in all his after life, being a period of nearly sixty years."

Dr. Blair was an ardent patriot, a high-minded, skilful physician, a safe counsellor, a sincere friend, and an earnest Christian.

MORTIMER G. PORTER, M. D., a native of Skeneateles, Onondaga County, was a son and grandson of physicians of that town. Having graduated at the Buffalo Medical College, 1849-50, Dr. Porter became one of the assistant physicians of the State Lunatic Asylum, where he remained several years, after which he located in New York City, where he entered upon the practice of his profession. He became connected with the Northwestern Dispensary, was a member of the New York Academy of Medicine, also of the Pathological Society, and was ardently devoted to his profession. He died of a fever contracted in the practice at the early age of 37, deservedly lamented.—*Amer. Med. Times*, Dec. 5, 1863.

FRANKLIN EVARTS, M. D., was born in Mexico, Oswego County, New York, in 1828, and was educated at the Academy in that town. He graduated at the University of the City of New York in 1854, and during 1855 was at Bellevue Hospital. In 1856 he visited London and Paris, with a view to avail himself of the advantages of attendance at the hospitals of those cities, and on his return, in 1857, began practice in the city of Oswego, where he at once took a high rank in his profession, and rapidly acquired a large and lucrative practice. He was President of the Oswego County Medical Society in 1860, and read before it several valuable papers. In 1861 he was elected a permanent member of the Medical Society of the State of New York. Shortly after the war broke out, he accepted the position of Surgeon to the 1st Regiment of Artillery, under the command of his friend, Col. Bailey, and shared, with heroism and fidelity, the labor of the campaign before Richmond in 1862. Subsequently prostrated with malarious fever, he was compelled to leave the field. Pulmonary disease attacked him, and he was unable to return to his regiment. In the spring of 1863 he accepted a position in the United States General Hospital at Central Park, where he continued until the autumn, when his symptoms becoming more alarming, he returned to Mexico, and there died February 12, 1864, at the early age of 36. He was a man of lively, genial nature, was possessed of a thorough medical education, and was eminently qualified for a successful practice.

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JOSEPH MARTIN, M. D., an old and honored member of the profession, and of the New York Academy of Medicine, died in the city of New York, April 26, 1864, aged 67 years.

Since Dr. Arnold's communication, one of the greatest of the profession, a surgeon of world-wide celebrity, has passed from the stage of active life.

Dr. VALENTINE MOTT was born in Glen Cove, Long Island, August 20, 1785, and died in New York, April 26, 1865, aged 80 years. He was graduated at Columbia College in 1806, as a Doctor of Medicine, and immediately after he visited the various European hospitals, improving himself under the leading surgeons of that time with whom he was on terms of easy intercourse. In 1809, having returned to his native country, he was made Professor of Surgery in Columbia College; in 1813, Columbia was merged into the College of Physicians and Surgeons, Dr. Mott continuing to fill the chair of Surgery. Various European colleges conferred honorary titles upon him, and he became a fellow of nearly all the scientific and medical societies of the world.

His reputation as a surgeon was as wide as the world, and in his own country he was justly regarded as chief of the corps of able operators who do credit to American surgery. Among his original operations are:—

"Ligature of the arteria innominata and of the primitive iliac."

"Exsection of the clavicle and of the lower jaw in different patients."

Immobility of the lower maxillary: "Cutting out two inches of the deep jugular vein inseparably imbedded in a tumor and tying both ends of the vein."

"Closing with a fine ligature wounds of a large vein and of a longitudinal and transverse kind, and even when an *olive-sliced piece* had been cut out."

His published works, according to a list furnished by himself to one of his intimate medical friends, are as follows:—

"Relative Anatomy of the Subclavian Arteries within the Scaleni Muscles."

"Memoirs on Injuries of the Skull and Brain; illustrated by cases."

"Essay on Pulsation in Epigastrium."

"Memoirs on Tying the Arteria Innominata."

"Several Papers on Exsection of the Lower Jaw in various Portions and Articulation on each side; with Plates."

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"Cases Illustrating the Utility of Tying the Common Carotid for the Safe Removal of Large Tumors, and Starving Malignant Diseases which cannot be Extirpated."

"Removal of Thyroid Body, which weighed Four Pounds, with entire success."

"Nasal Operation; with Plates. Original, successful."

"Distal, Anticardial or Brasdorean Operation on the Right Carotid for Aneurism of the Innominata, successful."

"Amputation at the Hip-joint, successful; Plates."

"Papers on Ligature of Carotids, Subclavians, External and Internal Iliacs."

"Exsection of Clavicle for Enormous Osteo-Sarcoma, ulcerated and bleeding, successful."

"Essay on the Treatment of Ununited Fractures; illustrated by cases."

"Memoir on a Peculiar Tumor of the Skin, which we have named *Pachadermatocele;* illustrated by drawings and cases."

"Paper on Laceration of the Corpus Cavernosum; with cases."

"Memoirs on the Removal of Enormous Tumors of the Neck of Small Children; with cases and drawings."

"Paper on Tying the Left Subclavian under the Scalenus Anticus, attended with peculiar circumstances."

"Letter to Liston, claiming originality in Lower Jaw Operations."

"Paper on the Malignant Pneumonia which prevailed at Newtown, Long Island, more than fifty years since."

"Life of Dr. Wright Post;" "Mott's Velpeau;" "Anniversary Discourses before the Graduates of the University of New York (1860);" "Mott's Clinics (1860);" "Discourses before the Binghampton (New York) State Inebriate Asylum;" "Eulogy on J. W. Francis, M. D.;" "Pain and Anæsthesia;" comprise the remaining list of Dr. Mott's published contributions to the medical art.

A most admirable memoir of Dr. Mott, superbly printed, and containing much of great interest in connection with this distinguished surgeon, has been recently published in New York, and prepared by Dr. Samuel M. Francis, son of the late illustrious Dr. J. W. Francis, from which much of the information here presented has been gleaned.

Dr. Mott was an exemplary Christian. "Bear me witness," says Rev. Dr. Houghton, when performing the funeral ceremonies, "then to him this day, here as he lies before us in death, as one who recognized his own and the universal need of a Saviour; who

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was a meek, and humble, and faithful follower of Christ Jesus our Lord, to whom only did he look for health and salvation; and as one who gladly and gratefully availed himself of every means of grace which God has mercifully provided for our comfort and assistance."

Adds Dr. Samuel M. Francis, at the close of his admirable biography, "Flowers, in rich beauty and number, variegated in color, sweet in perfume, formed crosses, anchors, wreaths, etc., filled the chancel, covered the altars, and surrounded the coffin, on which most appropriately was placed a mammoth crown, composed of japonicas, as a fitting symbol of excelling merit and acknowledged fame. The thronging multitudes could not find even standing room sufficient for one last, long, mournful sight of his remains. And when his body was borne towards the entrance of the vault, in Greenwood Cemetery, a chilling reality of our separation thrilled through the frame as the suggestive words, suspended by some sympathetic friend, 'welcome, dear Father,' and 'grand pa's come,' stood forth to view, as though the sainted spirits of two blest in God had been permitted to descend from heaven, and with angelic accents welcome him to the silent tomb. Comforting is it to feel that death is but the winter of the soul.

"Difficult indeed would it be to determine which were the more fitting title, for one who inspired respect throughout his eventful life, the GREAT Dr. MOTT or Dr. MOTT THE GOOD!"

J. AUGUSTINE SMITH, M. D., died February 9, 1865, in the 84th year of his age. January 8, 1827, he became a member of the County Medical Society; was an honorary member of the State Medical Society; for many years Vice-President of the Lyceum of Natural History, and one of the oldest of its associates. He was President for many years of the College of Physicians and Surgeons.

NEW JERSEY.

The following interesting sketches of deceased medical men of New Jersey have been furnished by Dr. William Pierson, of that State, whose constant interest in the necrology of the profession is deserving of honorable mention.

JEPHTHA B. MUNN, M. D., of Chatham, New Jersey, died on the 22d day of June, 1863, in the eighty-third year of his age.

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Dr. Munn was among the oldest physicians in the State, having been engaged in the active duties of his profession for more than sixty years. He was a faithful and successful practitioner. He was much attached to his profession, and always took an active part in the medical societies of his county and State.

JOHN B. JOHNS, M. D., was born in Morristown, Dec. 1, 1785, and died July 4, 1863. He was an alumnus of Nassau Hall, N. J., and of the Medical Department of the University of Penn. He pursued the practice of medicine in his native town. The *Transactions* of the Medical Society of the State of New Jersey, say of him: "Dr. Johns was a good physician; a discriminating observer of disease; a kind, sympathizing medical adviser; a public spirited and valuable citizen, and an exemplary and consistent Christian man."

JOHN C. ELMER, M. D., of Springfield, New Jersey, was born in Goshen, New York, April 7, 1817. He graduated at the College of Physicians and Surgeons in the spring of 1840. Immediately after graduating, he commenced the practice of his profession in the township of Mendham, New Jersey, where he remained until April 1852, when he removed to Springfield, a neighboring township, there pursuing the practice until the time of his death. Says a friend of him, "Intellectually, Dr. Elmer was characterized by strength and discrimination rather than by brilliancy. Spurning the merely superficial, he was patient in research, and unwilling to rest till sure of a foundation that could not be shaken. Possessed of a happy social talent, and unaffected manners, he found easy access to the hearts of his patients, and endeared himself to them by a kindness which reached beyond his professional services; sympathizing with them in their trials; and when occasion required, extending a helping hand for their relief."

Dr. JOHN S. DARCY was born in Hanover Township, New Jersey, Feb. 24, 1788. He succeeded his father, a leading physician in that vicinity, in the practice of his profession in his native place until the year 1832, when he removed to the city of Newark. He soon acquired an extensive practice and an especial reputation as a surgeon, which he retained until the time of his death, which occurred on the 22d day of Oct. 1863. The *Newark Daily Advertiser*, in noticing his death, says of him: "The distinguishing traits of Dr. Darcy's character were his genial and generous disposition, his

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devotion to those whose interests were intrusted to his care, and his lively sympathy with suffering in every form; and he will be missed by no class in the community more than by the poor and destitute, whose wants he so often relieved."

"SILAS L. CONDICT, M. D., who died in Jersey City, on the 7th day of Feb. 1863, was a native of New Jersey, born in Morristown, N. J., in August, 1806. His father, the Hon. Lewis Condict, was a physician, and one of the most eminent public men of New Jersey, was many years in the legislature, and for twenty years a member of Congress from that State. Dr. Silas Condict received his classical education at Princeton, and studied medicine under the direction of Dr. Jewell, of Washington City. Entering upon his profession, he practised for a time in Morristown, whence he removed to Newtown, L. I., where he remained some years. He afterwards settled in the city of New York, but soon returned to his native State, and finally chose Jersey City as his home, where he was taking an active and useful part in all the public interests of his native State, and distinguished himself as a faithful and skilful physician, a kind, unselfish friend, and a zealous promoter of the cause of morality, temperance, and religion."—*Medical and Surgical Reporter.*

WM. M. BROWN, M. D., of Newark, N. J., died April 15, 1864, in the 48th year of his age. He was an alumnus of the Jefferson Medical College, Penn. He was an active member of the medical societies in his county, and at the time of his death he was the President of the Essex District Medical Society. He was beloved by all who were acquainted with him. He had a manly sense of honor and right, an unsullied integrity, a consistent piety, and his professional merits and attainments, though never ostentatiously displayed, were always recognized, and commanded universal respect and esteem.

JACOB T. B. SKILLMAN, M. D., was born on the tenth of March, 1794, at Three Mile Run, New Jersey. He entered Union College, New York, in the year 1816. In his class were several persons who have attained to eminence, among whom was Honorable W. H. Seward, the present Secretary of State. Soon after graduating, he accepted a call from Hampden Sidney College, Virginia, as principal of the academy connected with that institution. Subsequently, he received the appointment of professor of the Latin and Greek

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languages in the college, but owing to ill health engendered by a southern climate, he declined the appointment and also relinquished his theological studies, which he had commenced under the celebrated Dr. Hodge, of Virginia. On returning to his native State, he began the study of medicine in the office of Augustus R. Taylor, M. D., of New Brunswick, New Jersey. After completing the appointed course of medical studies, he was licensed November 8, 1825, and settled at Woodbridge, New Jersey, in partnership with Dr. Freeman. He subsequently removed to Rahway, and thence to New Brunswick, where he remained until the time of his death. In each town, he was highly respected as a faithful and skilful practitioner of medicine. In the city of New Brunswick he discharged the duties of his profession faithfully and conscientiously during a period of thirty years. In the year 1847 he was elected President of the State Medical Society.

In early life Dr. Skillman made a profession of religion, and was for some time an office-bearer in the Dutch Reformed Church of New Brunswick. His walk was humble and consistent; vividly realizing the truth of the Gospel, it was his constant endeavor to adorn it in his daily vocation; nor was his hope deceived in its rich abundant consolations, for when disease prostrated his strength, he was patient and resigned; and when the king of terrors confronted him, his faith was luminous and his heart filled with peace and joy.

In May, 1860, he was attacked with congestion of the brain and slight paralysis, from which he partially recovered. In August, 1862, a second attack of paralysis confined him to his bed until June 20, 1864, when death ended his sufferings in the seventy-first year of his age.

J. Addison Freeman, A. M., M. D., U. S. V., was born in Paterson, New Jersey, on the 25th of June, 1833. He entered Nassau Hall, Princeton, in the junior class in the year 1850, and at the end of two years graduated with honors, having received the mathematical oration. In the spring of 1856 he received the degree of Doctor of Medicine from the College of Physicians and Surgeons, New York. He pursued the practice of his profession at Liberty Corner and at Orange, and in both towns he acquired a reputation as a kind and skilful physician. In the early part of the war he volunteered his services to his country. He was appointed a contract surgeon, and assigned to duty in a field hospital in McClellan's army. During

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the memorable seven days' retreat, he was taken prisoner, but was soon released. Subsequently he received a commission as Assistant Surgeon in the Thirteenth Regiment of New Jersey Volunteers, which position he filled in such a manner as to command the respect and admiration of both officers and men. After the battle of Gettysburg he was detailed for duty in a hospital, where he had an opportunity of performing many important operations in surgery. His conduct and skill exhibited in that capacity have been highly complimented by his senior medical officers. After the regiment was sent to the West, he was ordered to rejoin it, and soon afterwards was appointed Surgeon of it, vice Dr. Love, resigned. A little later, he received a commission (having passed a rigid examination for the same) as Assistant Surgeon in the volunteer corps, and assigned to Hospital No. 8, Nashville, Tennessee, where he remained until the time of his death, and for several months had been senior surgeon in charge. He died suddenly of congestive pneumonia, December 29, 1864. Thus has passed away, in the midst of usefulness, and in the prime of life, a man of sterling character and marked ability, and one who promised to be an ornament to his profession.

PENNSYLVANIA.

For the necrological records of this State we are indebted to various sources. The first two memoirs are furnished by Dr. Wm. Mayburry, of Philadelphia—that of Dr. Bournonville is from the pen of Dr. A. Nebinger, and Dr. George Hamilton contributes sketches of Drs. Haskell and Pugh.

The deaths of Pennsylvanians here recorded embrace a period, with few exceptions, of one year from the close of the necrological report of 1863 to the present time—June, 1864. The notices are limited chiefly to members of the American Medical Association, and to members of county and local medical societies. The material has been gathered from various sources—published and manuscript—and the language of the several authors is mostly retained.

Wm. Heyward Gillingham, M. D., was born at Frankford, Pennsylvania, on the 18th day of May, 1798 (7), and was the son of Thomas and Mary Gillingham. His paternal ancestors were among the early colonists. They are said to have accompanied Wm. Penn—probably in the year 1699—the second time he visited this continent. He belonged to a family remarkable for the lon-

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gevity of its members; several having reached fourscore and ten, and one nearly a hundred years in full possession of all his faculties.

Dr. G. appears to have received his elementary training at his native village, and at an early age commenced the study of medicine under the direction of Dr. Nathan Shoemaker. He graduated in medicine at the University of Pennsylvania in April, 1817—before he was twenty years of age.

Immediately after his graduation, he located himself in Philadelphia, where he continued to reside until his death, with the exception of about two years which he spent in India, and a few years at Kennett Square, in Chester County, Pennsylvania.

In 1824 he was married to Hannah, daughter of Caspar Schneider, by whom he had seven children, four of whom, three daughters and one son, with their widowed mother, survive to mourn his loss.

Dr. Gillingham belonged to the Society of Friends, and during his whole life, even from his earliest boyhood, was pre-eminently exemplary, and endowed with uncommon amiability, kindness, and gentleness of heart.

He held various positions of honor. He was long connected as accoucheur with the Philadelphia Hospital. He was Vice-President of the Philharmonic Society, and for many years physician to the Musical Fund Society.

He was elected a member of the Philadelphia County Medical Society, April 16th, 1850.

Dr. G. had the reputation of being an attentive, sound, and judicious physician, and as such was esteemed by his professional brethren, and greatly beloved by his patients. His practice was chiefly obstetrical, and at one time quite extensive.

His tastes were refined and cultivated. He took especial delight in music, being himself a proficient with the flute. He was a person of pleasing and courteous manners, of obliging disposition, of modest, unassuming and retiring deportment, and withal of irreproachable character.

He died of pleuro-pneumonia on the 9th day of January, 1863, in the 65th year of his age.

FRANKLIN BACHE, M. D., Ex-President of the American Philosophical Society, Vice-President of the College of Physicians of Philadelphia, Professor of Chemistry in the Jefferson Medical Col-

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lege, and one of the authors of the *United States Dispensatory*, died after a brief illness on Saturday afternoon, March 19th, 1864, in the seventy-second year of his age.

Prof. Bache was born in Philadelphia, October 25, 1792. At the age of eighteen he graduated at the University of Pennsylvania as Bachelor of Arts, and four years afterwards received his degree of Doctor of Medicine in the Medical Department of the same Institution. After spending a year in the army, as surgeon's mate, and two years as full surgeon, he resigned his commission and commenced practice in his native city. During the greater part of his long and industrious life, he was professionally connected with various public institutions. From 1824 to 1836 he was physician to the Walnut Street Prison; from 1826 to 1832 Professor of Chemistry in the Franklin Institute; from 1829 to 1839 Physician to the Eastern Penitentiary; from 1831 to 1841 Professor of Chemistry in the Philadelphia College of Pharmacy; and in 1841 he was appointed Professor of Chemistry in the Jefferson Medical College. This last mentioned position he held during the remainder of his life, and performed the duties connected with it in the most active and efficient manner.

Prof. Bache contributed largely to the medical literature of the country. He wrote a number of valuable works on medicine and chemistry, of which the *United States Dispensatory*, under the joint authorship of Dr. Geo. B. Wood and himself, has a world-wide reputation. As a member of the Publishing Committee of the *United States Pharmacopœia*, he also contributed much of the most valuable matter contained in that work.

His labors extended almost to the date of his death—his last illness being quite short. He attended to his duties during the whole of the last session of the Jefferson College, and was even at the party which was given on the evening of the last commencement of that Institution, only nine days before his demise.

Prof. Bache was a devoted friend of medical organization. Besides being a most active Fellow of the College of Physicians of Philadelphia, he was late Vice-President of the Medical Society of the State of Pennsylvania, of which he was a *permanent* member. He assisted in organizing the American Medical Association, of which body he continued a member up to the period of his death, and strongly urged its resuscitation by sending delegates to its proposed meeting at Chicago. He was also a member of the Philadelphia County Medical Society since April, 1849, and was

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much interested in the promotion of its objects. At the time of his death he was President of the Deaf and Dumb Asylum.

Prof. Bache was the eldest son of the eldest grandchild of BENJAMIN FRANKLIN, a brother of Colonel Hartman Bache, of the United States Engineer Corps, and a first cousin of Professor A. D. Bache, Superintendent of the Coast Survey. A daughter and four sons survive him—three of the latter being in the Government service.

Prof. Bache was universally beloved for his many social virtues and amiability of disposition; respected for his high tone of character, disinterestedness of purpose, unspotted integrity, and honorable course through life; and admired for his scientific attainments, especially in chemistry, to which his life has been devoted.

By the death of Prof. B. the profession has met with a serious loss in a literary, scientific, and *ethical* point of view, which will be mourned as truly national throughout the country.

Dr. ANTOINE BOURNONVILLE (son of Antoine Bournonville, of Lyons, France, and Mareane Gansen, a Dane) was born in Lyons, August 6th, 1797. The paternal ancestry of the Doctor were not without national merit, illustrating as they did the annals of France, by the part they played in some of the early wars in which the chivalric people of that country were engaged. Although born in France, his early years were spent in Copenhagen, Denmark, to which city his parents emigrated while he was yet a mere youth. It was here that he acquired both his academical and medical education. He pursued his academical studies with such industry and zeal as soon to win for him the degree of A. B., and subsequently A. M.

Immediately after finishing his collegiate course, he entered upon the study of medicine, his preceptor being Prof. Fengen, of the Royal College of Denmark, in which institution he graduated in 1818. After obtaining his medical degree, he became an assistant physician in one of the hospitals of Copenhagen. This service having no charms for him, he remained but a short time, and resigned for the position as Surgeon in the Danish Navy. It seems this service did not offer to him the kind and extent of professional labor he desired to be engaged in. He resigned from the navy, hoping to find more ample scope for the practical application of his professional knowledge.

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In early manhood, Dr. Bournonville was fond of travel; and having an intense desire to visit new scenes and places, we find him (after withdrawing from the navy) quitting Denmark, visiting Siberia, Lapland, Norway, and Sweden, in all of which countries he practised his profession. Tiring of these cold regions, he determined to try his fortune in another and a more genial clime. He concluded to make the Island of St. Thomas (then one of the Danish missions), the place of his future labors in his profession. Soon after arriving at St. Thomas, he was seized with an attack of yellow fever, which was very severe upon his economy, and implanted, it is thought, the seeds of the disease which finally terminated his earthly career. His passion for travel was not abated; and recovering from his attack of yellow fever, he had perhaps a dislike of St. Thomas, as a place of residence, for he quitted the island for the United States. He arrived at Philadelphia in 1825. In the following year he married Charlotte Abadie, a native of the south of France.

His restless nature was still unsatisfied, and he again yielded to his fondness for travel.

He left Philadelphia for Norfolk, Virginia, where he determined to take up a life long residence, and devote himself to his practice. Shortly after his arrival in Norfolk, that city was visited by the yellow fever, which prevailed with fearful malignancy. As the demand for physicians was great and pressing, Dr. Bournonville having some experience in the management of that disease, his services were eagerly sought, so that he very soon became actively and profitably employed. Although his prospects here were bright and inviting, yet he was unsettled. His hopes and longings again pointed to Philadelphia. After the birth of his eldest son, the present Dr. A. C. Bournonville, he left Norfolk for Philadelphia. Once more at Philadelphia, he finally overcame his desire for change of locality, and devoted himself to the every-day practice of medicine. He soon became one of the most successful and extensive practitioners of his day in the city, and continued to hold this position till the close of his life.

Dr. Bournonville was a member of the Philadelphia County Medical Society, and College of Physicians of Philadelphia. Desirous of having the honor of the degree of *M. D.* conferred upon him by a Philadelphia medical school, he graduated *ad eundem* in the Jefferson Medical College in 1848. He was consulting physician for many years to the French and German benevolent societies

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of Philadelphia; and at the period of his death was one of the trustees of the Girard bequest to the Masons, of which order he was a prominent member, and for two years Grand Master. He was a member also of the order of Odd Fellows, and belonged to numerous charitable institutions.

Notwithstanding Dr. Bournonville had so extensive and varied a knowledge of disease in all its forms, and from close observation having great experience, yet he never left to the profession a record of his opinions, or a monograph on any medical subject. This is a very common fault with members of the profession; either from indifference or neglect, they fail to record many important facts in pathology and therapeutics, which thus die with them, and leave no benefit to those who come after them.

Dr. Bournonville was the first (about the year 1859) to prescribe as an antiseptic and caustic the permanganate of potassa. He used it in treating a case of elephantiasis, and in leucorrhœal discharges, etc.

In his professional intercourse with his medical brethren, Dr. B. was respectful and honorable. The poor and needy always found in him a helping friend. In social life he was amiable and upright, winning without effort the confidence and respect of his associates.

For a long series of years the doctor was afflicted with chronic gastritis and cardialgia; supposed to have been the product of his early attack of yellow fever already spoken of. He continued in the practice of his profession, although harassed with pain and suffering, until failing humanity could bear up no longer. For rest, and with the hope of recuperation and repair, he retired from the field of his labors in October, 1862. From this period he continued steadily to decline, until at length it became apparent to him that his end was approaching. Calmly contemplating time and eternity, death and the grave, with the philosophy and resignation of one who, having discharged his stewardship to the best of his abilities, and relying upon Divine mercy for forgiveness of his errors and sins, he gathered his mantle about him, peacefully and without a struggle, on the morning of February 27, 1863, in the fulness of his 67th year, Dr. Bournonville passed from earth, as we hope, "to the abode of the Just made perfect."

"Requiescat in pace."

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JOSEPH HENRY HASKELL, M. D., the subject of this notice, was a native of the State of Massachusetts, and was born in the town of Rochester, where his father, a practising physician, and a member of the Massachusetts State Medical Society, now resides. Having commenced the study of medicine under the supervision of his father, he came to Philadelphia in the year 1841 or 1842 attended a course of lectures at the Pennsylvania Medical College, and subsequently another course at the Jefferson Medical College, from which latter institution he graduated in 1844 or 1845. Choosing the city of Philadelphia as the place of his residence, he located himself in the northern part of the city, where he continued to be engaged in the practice of his profession until the close of his life.

If the practice of Dr. Haskell was not so extensive as that of some others, he was at least esteemed to be an excellent physician, and was chosen medical attendant to the House of Refuge, in which capacity he served several years, and was also elected physician to the Northern Home for Friendless Children.

Kindness and gentleness of manner were prominent traits in the character of Dr. Haskell. He was remarkable for his nice sense of honor, that quality so highly appreciated by every truly upright member of our profession. So sensitive was he on this point that (if we have rightly estimated his character) he would do himself an injustice sooner than incur the slightest suspicion of doing or saying ought that might promote his own advantage, pecuniarily or otherwise, at the expense of a brother practitioner. Every attempt to wantonly disparage others, or to supplant them by direct or indirect, and more insidious means, such as unusual or extraordinary attentions to the patient of another practitioner who might temporarily fall into his hands, or by an exhibition of extreme condescension, obsequiousness, etc., were sedulously avoided, and indignantly scorned by him.

The physical condition of Dr. Haskell, for a few years before his decease, was not so perfect as external appearances indicated, there being evidence of some abnormal condition of the heart, both as regards its size and the condition of its valves. His general health, however, was good, until a sudden attack, of but two days' duration, terminated his mortal career in the 42d year of his age.

JOHN MCGINNESS PUGH, M. D. (only son of John and Eleanor Pugh), was born in Chester County, Pennsylvania, on the 11th day

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of October, 1809. His parentage was highly respectable, his father being a leading member of the Great Valley Baptist Church, of which he was also one of the deacons for more than twenty years.

He commenced the study of medicine in the year 1828, under the direction of Dr. Chas. M. Griffiths, of Philadelphia, and graduated in 1830 or 1831 at the Jefferson Medical College, presenting as the matter of his thesis, the subject of "Dislocation."

Immediately after his graduation, he began the practice of his profession in Tredyffrin Township, the place of his birth. Here he remained two years, and during the prevalence of the cholera of 1832 he was appointed to the charge of the Union Landing Hospital, the duties of which post he discharged with fidelity and advantage to the inmates. From this place he removed to West Philadelphia, and there engaged in and continued to fulfil the duties of his profession until the close of his life.

The practice of Dr. Pugh was at one time quite extensive, and much confidence seems to have been placed in his skill and judgment. He appears to have had a predilection for surgery, and had considerable success in this branch of medicine. He was appointed vaccine physician for West Philadelphia in 1852; was one of the physicians to the Welsh Society, and served as a Comptroller of the Public Schools.

Dr. Pugh enjoyed the advantage of a sound English education, and had some knowledge of the classics, which he cultivated by the dint of personal application during his leisure hours. In his early years he was a close student, and embraced every opportunity for the improvement of his mind. Possessed of considerable talent for literary and scientific pursuits, he did not confine himself entirely to his profession, but was an occasional contributor to the miscellaneous periodicals of the day, and on more than one occasion, he was found courting the muses!

Naturally of a timid and retiring disposition, he was disqualified for great usefulness in the arena of public life, while his extreme modesty unfitted him for the more spirited scenes of the social circle.

Early in life Dr. Pugh gave attention to the subject of religion, and connected himself with the Great Valley Baptist Church. Subsequently he joined the Spruce Street Baptist Church of this city, in the communion of which he remained until the day of his death.

The illness that terminated the existence of Dr. Pugh was of

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short duration. He died on the 24th day of September, 1863, in the 54th year of his age. His remains were interred in the graveyard of the church he had joined in the morning of his life. His widow, to whom he was married in 1854 (with his only child, but two months old), and two sisters were left to mourn his sudden departure.

JOHN REDMAN COXE, M. D., who died March 23, 1864, was born in Trenton, N. J., on the 16th of September, 1773. He was educated in Philadelphia, under the charge of his grandfather, Dr. John Redman, until his tenth year, when he went to England, and afterwards finished his classical education in Scotland. He returned to America in 1790, and at once commenced the regular study of medicine with Dr. Benjamin Rush, with whom he remained until 1794, when he received his diploma. While with Dr. Rush, he was actively engaged in practice during the severe visitation of the yellow fever in 1793, at which time three of his five fellow students died of the fever.

Immediately after graduating he went again to London, where he became a house pupil at the London Hospital, and remained there nearly a year. He then again visited Edinburgh, and attended a course of lectures at the University. Afterwards he went to Paris, where he pursued his medical studies for three months, and then returned to London, spending several months in the hospitals.

Returning to the United States, he settled in Philadelphia, in the winter of 1796-7, when he at once entered upon the active practice of the profession for which he had been so carefully preparing himself by many years of study.

He was distinguished for his great learning, and was especially devoted to ancient authorities in science.

Dr. Coxe was appointed, by the Board of Health, Physician to the Poor, during the second visitation of the yellow fever in 1798, and was for several years one of the physicians of the Pennsylvania Hospital and the Philadelphia Dispensary. In 1809 he was elected Professor of Chemistry in the University of Pennsylvania, from which chair he was transferred, in 1818, to that of Materia Medica and Pharmacy, which he held until 1835.

For many years he had led the quiet and retired life of a student. Dr. Coxe was one of the earliest who introduced vaccination into the United States, and was the first to introduce it into this city. His name has, for more than half a century, been a household word

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in connection with the Hive Syrup (syrupus scillæ compositus) which he invented, and which has proved such an inestimable blessing to thousands. He has passed away quietly, without disease, at the advanced age of ninety years and six months, having hardly been sick a day during his life.

MARYLAND.

SAML. CHEW[1] was born on the 29th of April, 1806, in Calvert County, Md., where his ancestors had resided from a very early period of the colonial history of the State.

Dr. Chew's early education was received at Charlotte Hall, in St. Mary's County, Md.—an academy which has always enjoyed an extensive reputation throughout the State. After completing the course at that school, he entered the Sophomore class of the College of New Jersey, at Princeton, in 1822, where he graduated with distinction in 1825, receiving the degree of A.B.; and three years subsequently that of A.M. On leaving college, he commenced the study of medicine, devoting the first year to preliminary reading, and afterwards attending three courses of lectures in the Medical Department of the University of Maryland, from which school he received the degree of Doctor of Medicine, April 6th, 1829.

The first five years of his professional life were spent in his native county, but in 1834 he removed to Baltimore, to continue the practice of medicine, in what he regarded as a better field.

In 1841 he was elected to the Chair of Materia Medica in the University of Md., which had become vacant by the death of Dr. Saml. G. Baker. This post he filled until 1852, when he was transferred to the Chair of Principles and Practice of Medicine, which he held until his death.

For the last few months of his life he had been engaged in preparing for publication a volume of *Lectures on Medical Education*, which was completed only a short time before his death, and has been published posthumously.

On the 17th of December, 1863, he had given his usual lecture at the college, but came home immediately afterwards, suffering

[1] We are indebted for the biographical facts in connection with the late Dr. Chew, to his son, who succeeds his father in the Chair of Practice in the University of Maryland.

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from a severe chill, the precursor of a pneumonia, which ran a rapid course, terminating fatally on the 25th of December, only eight days from its first assault.

Dr. Chew lived from early youth, and died in the communion of the Protestant Episcopal Church, of which his grandfather, the Right Rev. Thos. J. Cleggett, was the first Bishop in the State of Maryland. His whole life fitly illustrated the sincerity of his belief in the inspired teachings of Christianity. Professor Chew enjoyed in an eminent degree the confidence of the community in which he labored. He was an untiring and constant student, and his attainments in the whole circle of literature and science were of most extraordinary extent.

Dr. JOHN P. MACKENZIE was born in Baltimore on the 8th of April, 1800—was educated in that city, and at the age of 18 entered upon the study of medicine in the office of Dr. George Brown and his father, Dr. Colin Mackenzie. In March, 1821, he graduated at the University of Maryland, and was then admitted as a partner in the before-mentioned firm. After the death of Dr. Brown, he continued with his father until his death, which was in 1827. After the death of his father, the management of the hospital devolved upon him, until the expiration of the lease of that institution, which terminated in 1832. He pursued his profession until the day of his death, which occurred on the 14th January, 1864.

No man in Maryland held a more exalted position for stern morality, high sense of honor and professional skill. His death, which was mourned by a wide circle, has occasioned a vacancy not soon to be supplied.

WEST VIRGINIA.

Dr. John C. Hupp has obligingly forwarded the following information of the eminent medical dead of his State:—

JOHN W. MOSS, M. D., of Parkersburg, West Virginia, who died January 1, 1864, aged about 45, was born in Fairfax County, Virginia.

He enjoyed the advantages of an early classical education, and studied medicine with his brother-in-law, Dr. Hugh H. McGuire, in Winchester. After taking the degree of M. D., he commenced the

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practice of his profession in Parkersburg, where he labored with marked success for about twenty years.

He was a man of more than ordinary ability, and, enjoying the confidence of the people, he wielded more influence, politically, than any man in his county. Though importuned, he sedulously refused to accept any office, until 1861, when he was triumphantly chosen to a seat in the Virginia Legislature, which he would have occupied had not his loyalty rendered it impracticable.

He was President of the memorable convention which assembled in Wheeling on the 13th of May, 1861, and condemned the Ordinance of Secession as being destructive of the rights and interests, social and political, of Western Virginia.

He was also a member of the convention of representatives of the people that assembled at Wheeling on the 11th of June, 1861, which repudiated all allegiance to the Rebel Government and reorganized the State Government.

During the sitting of the latter convention, Governor Pierpoint tendered him the Colonelcy of the Second Reg. West Va. Vol. Infantry, which he accepted and commanded for about one year, when, on account of ill-health, he reluctantly resigned the commission.

Soon after this he was proffered and accepted the post of Surgeon of the 14th West Va. Vol. Inf., and officiated in that capacity at the moment of his death.

He died suddenly, of heart disease, in the midst of his labors, a good physician, a faithful public officer, a daring soldier, brave to rashness, and highly esteemed by a wide circle of friends and admirers.

Joseph Thoburn, M. D., of Wheeling, West Virginia, was born near Belfast, Ireland, April 29, 1825. When he was about three months old his father, Mr. Matthew Thoburn, an intelligent and highly respected citizen, and an exemplary Christian, emigrated to the United States, and settled in Belmont County, Ohio. His educational advantages were only such as the common school of the country district, where his parents lived, afforded. He secured a thorough English education, and by a diligent course of reading, his mind was at an early age well disciplined, and stored with general information.

When 18 years of age he began to teach in Belmont County, and spent three years in this occupation. His attention having

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been directed to medicine, in 1847, he became a pupil of the accomplished Dr. Ephraim Gaston, of Morristown, Ohio, where he spent two years, and subsequently prosecuted his studies in the office of Prof. Carter, of Starling Medical College, in which institution, February 25, 1850, he graduated as M. D.

April 1, 1850, Dr. Thoburn located in Cookstown, Fayette Co., Pa., where he practised nearly two years, and was in the enjoyment of a large share of public confidence, when, November 1, 1861, he was called to the responsible post of Assistant Physician in the Ohio Lunatic Asylum. July 1, 1852, he was removed, together with all the other officers in the institution, on account of their political relations.

He spent July and August of 1852 in New York hospitals, and in September settled in Wheeling. Resuming a general practice, his influence was not slow in making itself felt in this new field of labor.

Endowed as he was with varied capabilities and excellencies, a nature and manner genial and companionable, he came rapidly into the enjoyment of public confidence. His admitted merit, the extent of his information, the weight of his character, all conspired to secure him the highest esteem and respect of his medical brethren. He was successfully attending to the duties of his profession when the Rebellion broke out. Prompted by a sterling patriotism which nothing but death could extinguish, he entered into the service of his country, acting during the three months' campaign as surgeon of the 1st Regt. West Virginia Vol. Infantry; and as soon as he had accomplished its reorganization under President Lincoln's second call for troops he was chosen the colonel of the same regiment, which with its brave leader carried terror to the enemy on so many bloody battle-fields.

Col. Thoburn was in the engagement at Blue Gap, and the first battle at Winchester, where he was severely wounded in the left arm. He was in *all* the battles and skirmishes in the Shenandoah Valley, under Gen. Banks, and he fought at the battles of Port Republic and Cedar Mountain. Though sick, he commanded at the second Bull Run battle, and was in the saddle for three weeks when he should have been in the hospital. At length, stricken down with typhoid fever, he lay in Alexandria, Va., delirious for many weeks, during which time there was but little if any hope of his recovery.

During the year 1863, he was on duty in the valley of Virginia,

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at North Mountain, and at Petersburg in Hardy County. His escape from the latter place with his forces was regarded by military men as the most difficult and successful achievement of the war. During this year he commanded a brigade under the lamented Col. Mulligan.

He fought in 1864 with Maj.-Gen. Sigel at the battle of New Market. Under Maj.-Gen. Hunter, he commanded a brigade at the battle of Piedmont; fought at the battle of Lynchburg, and was in *all* the series of battles and skirmishes in Hunter's raid.

When the rebel Early made his raid down the valley, and the summer campaign of 1864 was organized, Col. Thoburn was placed in command of a division. He commanded at the second Winchester fight, when a horse was killed under him. He was also in command at the hard-fought battle of Snicker's Ford.

He led the first division of General Crook's army, which turned the fortunes of the day at the battle of Opequan Creek, where two horses were killed under him. He commanded at the storming of Fisher's Hill, and advanced with Gen. Sheridan's army up to Harrisonburg. When the rebel army lay near Strasburg, Col. Thoburn requested of Gen. Sheridan permission to go with his division as skirmishers, and ascertain the enemy's strength and position, which request was granted, and after a hot engagement the object was successfully accomplished.

On the 19th of October, 1864, Col. Thoburn fell nobly fighting for his country's flag, at the battle of Cedar Creek in the Shenandoah Valley. The rebels killed no better man. Let his name be inscribed among those of patriots and heroes, as was that of Dr. Joseph Warren, who fell at the battle of Bunker Hill, in 1775.

ILLINOIS.

Dr. David Prince contributes the following sketch:—

Samuel Long, M. D., of Springfield, Illinois, was born in Frankfort, Ky., in 1825, and graduated at Louisville in 1851.

He was a pupil of Dr. W. C. Sneed, of Frankfort. He removed an ovarian tumor weighing twenty-one pounds, from a patient much reduced, and the success was complete. His health failed from pulmonary tubercular deposit, and obtaining a diplomatic appointment from President Lincoln, he spent a year in the Sandwich Islands. He seemed to live a year on pure force of will after

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his disease had appeared to be very near a fatal termination, and died October 3d, 1863.

As a practitioner, he was decided and bold, never hesitating to follow the deductions of his reason, whether sustained by others or not.

IOWA.

The following biographical memoranda from Dr. D. L. McGugin, of Iowa, constitute the record of the dead of that State:—

Peter Walker, M. D., was a native of Ross County, Ohio, and read medicine in Champaign County, where he afterward practised his profession until 1843, when he removed to this State. Fond of the pursuits of agriculture, he abandoned his profession, but was not long permitted to remain in retirement, but felt compelled to devote his whole time to the practice of medicine. He removed to the village of Libertyville, in which place he resided until September 9th, 1862, at which time he received a commission as Assistant-Surgeon in the 30th Regiment, Iowa Infantry.

The regiment, as soon as organized, was ordered to Helena, Arkansas. On the way, at Memphis, he was seized with diarrhœa, which continued, but did not confine him. General Washburne made a raid in considerable force about the first of December into Mississippi, and Dr. Walker accompanied the expedition. The weather was cold and moist, the roads were almost impassable, and yet the corps made forced marches. The exposures and fatigues proved too much for him in his then condition, and his diarrhœa was seriously aggravated. The writer saw him very soon after his return to camp, and advised him to resign and return home as speedily as possible, which he did on the 26th of December. In a few days after his arrival there he died.

Dr. Walker's literary acquirements were not liberal, but he was a man of good judgment, and possessed a large share of common sense. He was much esteemed by all who knew him for his genial and kindly disposition. No appeal was ever made for aid and assistance that did not meet with a response, and he was not unfrequently made the victim of a misplaced confidence.

He served in the Legislature of the State one term, and gave his support toward the establishment of the benevolent enterprises now existing.

He was an exemplary Christian and member of the Methodist Episcopal Church.

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He left a large family to grieve over his loss, in which the members of the community in which he lived participated. Especially do his patrons mourn the demise of one who was ever a friend when suffering demanded relief and sorrow appealed to the kind heart for sympathy and encouragement.

GEORGE REEDER, M. D., was born in St. Mary's County, Maryland, in 1820, and graduated at the University of Maryland in 1840. He was for a long time senior student in the Infirmary of Baltimore, during which, by his talents and assiduity, he so far won upon the affectionate esteem of the able faculty of that day, that when he was about to leave for the far west, they gave him letters testifying, in the highest terms, their appreciation of him as a man and his talents and acquirements as a physician. After a perusal of these letters, which have been furnished to the writer from such men as D. James Thomas, of Baltimore, John Stephens, of Bladensburg, and Professors Wm. N. Baker and Samuel G. Baker, of the University of Maryland, and others, no young man who had left his home in the *East* to organize for himself an establishment in the *West*, had appeared to have a better record or brighter prospects.

He settled in the flourishing town of Muscatine, located on the west bank of the Mississippi, in the county of Muscatine, in the State of Iowa, and his success was equal to the most sanguine expectations of his friends.

His quiet and modest demeanor, his gentlemanly deportment, his dignified mien, his kindness and sympathetic manner toward the sick, and his success as a physician, soon formed for him a host of friends and admirers, and he became deservedly one of the most popular medical men of the West, and this, too, without seeming to desire the plaudits of the world. He was ever in his field of duties, seldom leaving home and the demands of practice.

Dr. Reeder was a good surgeon, and used the knife gracefully and skilfully. When he first established himself in Muscatine, there were few who practised surgery, and therefore the field was wide open for him, and he was called in surgical cases at considerable distance from home.

He was a man of fine judgment, deliberate in his investigations, and safe in his diagnosis. Nature seemed to have imparted to him all the attributes of a physician and a good man. He certainly fulfilled the prediction made of him by Prof. S. G. Baker, when he

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said of him, "He will receive, as he deserves, the confidence of his fellow-men, and attain a high rank as a medical man."

Dr. Reeder received a commission in the summer of 1861 as surgeon in the 2d Regt. of Iowa Cavalry, and while serving in this capacity, his health failed him, and in June following (1862), he resigned and returned home, where he lingered a short time and died from diarrhœa, lamented and regretted by a large circle of friends.

He left a wife and three children to grieve over the loss of an affectionate husband and a kind and indulgent father.

Amos Witter, M. D., the subject of this notice, was born in Ontario County, N. Y., in 1807. When he was quite young his father migrated to Ohio, where he received his medical education and graduated at the Medical School at Cincinnati. He commenced his career in practice in Seneca County in 1823, and was successful in obtaining practice. In 1849 he emigrated to this State, and immediately secured a liberal patronage, which was, from time to time, enlarged. During this time he was repeatedly sent to the Legislature, where he acquired much influence and became very popular. He was engaged in all the great benevolent enterprises which demanded the aid and sanction of that body, and very often was the projector of many humane and moral reforms.

When the war had fairly begun, and a call for troops was made, among the first regiments raised in Iowa was the famous 7th, to which he was, although somewhat advanced in years, appointed Surgeon, and in this position he made himself conspicuous by his skill and his devotion to the well-being of the sick and wounded of his regiment. In the battle of Belmont, he remained on the field with the wounded until the advancing columns of the enemy and a shower of musket-balls drove him from his duties. Then at Forts Henry and Donaldson, he displayed, not only great philanthropy, but true heroism in exposing himself, when under the hot fire of the enemy, in care for the wounded. As one remarked, "Nowhere was greater moral patriotism and fortitude displayed than in the person of Surgeon Witter." During the battle of Donaldson, when he was not directly engaged with the wounded, he cheered the men on to the conflict. He labored night and day without rest; but his age and feeble frame failed to rally from the shock of an overworked body and mind, and in this condition he hastened from this

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"dark and bloody ground" to his home, where he arrived March 4th, 1862, to close a life of great usefulness and honor.

He died on the 13th March, at Mount Vernon, Ohio, of erysipelas. So imbued was he with patriotic sentiment, that but a short hour before his death, his mind calm and rational, he sang the "Star Spangled Banner," then breathing a prayer in his own behalf and for his country, he sank peacefully to rest.

Dr. Witter was a man of strong mind, and endowed with quick perception. He was a living exemplification of a restless spirit; but all his thoughts were directed by a desire to do good. He was a high-minded and honorable gentleman, and devoted to his friends, whom he never forgot or abandoned.

The writer was once Medical Inspector of hospitals, and that of Surgeon Witter was included in his charge. Here was evinced that tender regard for the sick soldiers under his control which so eloquently proclaims the goodness and generosity of the heart. He omitted no endeavor to promote the comfort and well-being of the numerous sick of his regiment; and this kind care, together with his skill in treatment, told well upon the men. Dr. Witter was an honest man—the highest compliment which can be bestowed upon the character of any man while living, and the best inscription upon his monument when dead!

UNITED STATES ARMY.

Surgeon General Barnes sends from the records of his office the following memoranda:—

Surgeon GEORGE HAMMOND, U. S. A., was lost overboard on the Mississippi River, from hospital transport R. C. Wood, on the morning of the fourteenth of August, 1863. "He had been suffering about ten days with subacute inflammation of the liver, and probably fell overboard in a momentary delirium." (Report of Surg. Jno. Moore, U. S. A.)

Assistant-Surgeon C. M. COLTON, U. S. A., died March 1, 1864, in Division Hospital, Fifth Corps, Army of the Potomac, of gastro-enteritis. (Report of Asst.-Surg. E. D. Breneman, U. S. A.)

Assistant-Surgeon JOHN T. REILY, U. S. A., died at Helena, Arkansas, on the 5th of May, 1864, after but a few hours' illness.

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Surgeon F. M. HEISTER, U. S. Vols., died at Reading, Pennsylvania, April 9, 1864, while on leave of absence; disease unknown; supposed to be chronic diarrhœa contracted at Hilton Head, S. C. (No official report of death.)

Surgeon E. F. BATES, U. S. Vols., died in Washington, D. C., March 7, 1864, of ileo-colitis. (Reported by Surgeon Thomas Antisell, U. S. V.)

Surgeon J. G. KEENON, U. S. V. Date, place, and cause of death unknown. Death noted on weekly report of Adams' Hospital, Memphis, Tennessee, for August 12, 1864.

Surgeon A. L. COX, U. S. V., died at Chattanooga, Tennessee, on or about August 1, 1864. Cause unknown.

Assistant-Surgeon J. A. FREEMAN, U. S. V., died at Nashville, Tennessee, Dec. 29, 1864, of pneumonia.

Surgeon R. M. S. JACKSON, U. S. V., at Lookout Mountain, Tenn., Jan. 18, 1865, of pneumonia.

Assistant-Surgeon M. F. COGGSWELL, U. S. V., at Albany, N. Y., of quinsy and carbuncle, Jan. 21, 1865.

It is to be regretted that no record has been furnished from the Naval Medical Bureau in time for this report.

CHRIS. C. COX,
Chairman.

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PRIZE ESSAY.

ON THE

SURGICAL TREATMENT

OF

MORBID GROWTHS WITHIN THE LARYNX.

BY

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"Quod vidi, scripsi."

STOERK.

WITH TWELVE WOOD-CUTS, TWO UNCOLORED AND TWO COLORED LITHOGRAPHED PLATES.

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EXPLANATORY NOTE.

THE following Essay was written during the first week of June, 1864. It was immediately sent to the Chairman of the Committee on Prize Essays of the American Medical Association; but, coming too late for competition in that year, was allowed to lie over till 1865. It was planned and finished, including the drawing of most of the wood-cuts, in three days and nights, and has not been touched since. Though considering the state of the subject at the date of its composition sufficiently well represented, I do not wish it to be supposed that the omission of revising the Essay during the year that followed arose from non-recognition of its imperfections. Much as I felt the desire of improving it, I was prevented by severe illness, in consequence of a dissecting wound, and constrained absence from home. I therefore add a few remarks here.

I have considerably modified the opinion on the removal of an intra-laryngeal growth by laryngotomy preceded by tracheotomy, expressed on page 667, namely, "that in cases in which loss of voice is a principal question, it could never be indicated, and that it could be justly performed only as a last resort to save life if no other means should succeed." My views of the serious nature and risks of the operation remain unchanged, and I would lay down, even more positively than before, the rule that in *all* cases of *choice*, the preference should be given to the laryngoscopal operation through the mouth. But enlarged experience has taught me that cases do occur, in which the tumor is either not sufficiently accessible, or, at all events, not entirely removable by the mouth; and the recently recorded cases of Ulrich and Lewin, Sands, and others, prove that success as to extirpation, combined with at least partial success as to voice, may crown the operation after tracheo-laryngotomy. Sands' case is referred to in the Essay, page 666; being at the time unpublished, however, its details had not then come to my knowledge. Dr. Sands deserves great credit for his accurate performance of the whole operation, and his case is especially important in this connection, as the first on record, in which the voice was improved.

I have become more familiar, practically, with *Türck's* and *Lewin's* instruments for laryngoscopal surgery, than I was at the time of writing

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the Essay, and now recommend these very strongly, especially the scissors of Lewin, regretting that I have no opportunity at present of figuring and describing them.

Four additional cases of intra-laryngeal growths have come under my observation. In one I removed a rounded excrescence a quarter of an inch in diameter, and a number of smaller ones, and sent the patient home perfectly well, within a week after I saw her for the first time; one—the case of a child three years old, sent from a distance, and seen but once to make the diagnosis, as the mother was unable to stay in the city longer—died, *post-mortem* examination proving the larynx filled with epithelioma; one awaits operation by ecraseur or cutting instruments; and one is very nearly cured, but is still under treatment (present treatment, chromic acid and tannin as deprivers of moisture). All these will be published in due time.

Of the eleven cases of the Essay, I have to state that

Case I., I now consider an appropriate one for tracheo-laryngotomy, as the morbid mass continues to grow in spite of all removals and cauterizations practised *per vias naturales*, by which ways it certainly can never be eradicated. I defer details for later publication.

Case II. Returned for treatment; fear of recurrence of tumor unfounded; voice now materially improved, only at times a little hoarse.

Case III. Perfectly well.

Case IV. This lady I have not seen, but heard through friends that without further treatment, she gradually improved, and is now entirely comfortable. She has no cough, speaks naturally, and is thought to be able to sing. She has since confessed her belief that she herself contributed much, by great imprudence, neglect, and exposure, during the time she was under my care, to the occurrence and continuance of the violent laryngitis, from which she suffered soon after the removal of the polypus.

Case V. I have examined frequently since. The shrunken stump is still visible; the voice has remained very good, except that on two or three occasions he "caught cold" and was temporarily hoarse.

Cases VI., VII., and VIII. I have every reason to believe remain well.

In Case IX., cauterization was irregularly continued for several months after the Essay was written, until the harshness and hoarseness of voice yielded.

Case X. This young lady is an excellent singer.

Case XI. Remains still unoperated on. The polypus has grown very little, but I intend to remove it soon. This tumor has become a standard one for exhibition to physicians visiting my office, the patient kindly consenting, having gained unusual control over the organs involved.

New York, 153 West 15th St.,
January, 1866.

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CONTENTS.

Explanatory Note 655

Section I.—Introductory 659

Fatality of the disease, modern triumph over it 659

Frequency—Structure—Form and size—Seat of attachment—Causes—Symptoms—Prognosis 660

Section II.—Operations Heretofore Practised 664

I. Removal after tracheo-laryngotomy—Ehrmann's case, Buck's and Sands' cases—Its advantages and disadvantages 664

II. Removal after subhyoidean pharyngotomy—Prat's case—Advantages and disadvantages 667

III. Removal through oral cavity 669

A. By the knife—Green's first case 669

B. By the ligature 671

Simple ligature—Koderik's case 671

Galvano-caustic wire—Middeldorpf's case . . . 671

C. By the probang—Green's second case 672

Inapplicability of these operations 674

Section III.—The Surgical Treatment of To-day 674

Indications—How fulfilled 675

I. Cauterization—Instruments—Agents—Indications—Preparation—Anæsthesia—Mode of operating 675

II. Discision—Instruments—Case recorded—Mode of operating . . 683

III. Crushing—Case recorded—Instruments 685

IV. Evulsion—Indication—Caution—Instruments 685

V. Ligation—Galvano-Caustic Ligature—Ecraseur 688

VI. Excision—Cases recorded—Mode of operating—Instruments . . 688

"Scraping" 691

Section IV.—Report of Eleven Cases, occurring in the Writer's Practice, with Portraits as Reflected by the Laryngoscope 691

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PRIZE ESSAY.

ON THE SURGICAL TREATMENT OF MORBID GROWTHS WITHIN THE LARYNX.

SECTION I.—INTRODUCTORY.

At its session in New York, in May, 1853, Dr. Gurdon Buck presented to the Association a paper entitled as the present. Since then the diagnosis and treatment of laryngeal affections have been entirely revolutionized by what is termed authoritatively "one of the most important inventions of modern times."[1] The subject of this essay, which illustrates the most brilliant achievement resulting from this invention has well-founded claims, therefore, it seems to the present writer, to be again brought before this body. Inevitably fatal in their tendency—destroying in a greater or less degree the

[1] The Laryngoscope, Illustrations of its Practical Application, and Descriptions of its Mechanism. By George D. Gibb, M. D., M. A., Member Royal College of Physicians, London; Physician to the West London Hospital, etc. London: Churchill, 1863, p. 3.

Die erste Ausrottung eines Polypen in der Kehlkopfshöhle durch Zerschneiden ohne blutige Eröffnung der Luftwege nebst einer kurzen Anleitung zur Laryngoskopie, von Victor v. Bruns, Doctor der Medicin und Chirurgie, Professor der Chirurgie und Chirurgischen Klinik, Ritter, etc. etc. Tübingen, 1862, p. 1.

Die Laryngoskopie und ihre Verwerthung für die ärztliche Praxis. Von Dr. Friedrich Semeleder, Docenten an der Wiener Hochschule, etc. Wien, 1863. Wilhelm Braumüller.

Reviews by Dr. C. L. Merkel. Schmidt's Jahrbücher der in- und ausländischen gesammten Medicin. Leipzig: Otto Wigand, 1861, '62, '63.

Cours Complet de Laryngoscopie. Par Dr. Moura-Bourouillou, etc. Paris, 1861.

"In the hands of those accustomed to its manipulation, its use effects what has been heretofore looked upon as marvellous, for it renders 'the dumb to speak and the deaf to hear.'" Diseases of the Throat and Windpipe, etc. By George Duncan Gibb, M. D., M. A., etc. Second Edition. London: John Churchill & Sons, 1864. Preface, p. viii.

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means of intercommunication in society, the voice, which, in its perfection, constitutes one of the grandest distinguishing characteristics of humanity—inflicting the most terrible suffering, by interference with one or both of those momentous functions in the animal economy, respiration and deglutition: morbid growths within the larynx have hitherto skulked in the dark, plying their work of death unseen, and often unknown. Less than six years ago, Czermak, upon turning the light of the laryngeal mirror into their lurking place, espied a polypus in a case of supposed nervous hoarseness, and, ever after, "behold, *the murderers stood convicted.*" What a glorious triumph for the faithful watchman of our art to chronicle! Cases of small tumors attached to one or both of the vocal cords have, since, repeatedly been presented to me which, though they had persistently baffled the skill of the most eminent among us, were with the laryngoscope recognized in as *many* seconds as the disease had previously existed years, undetected, even unsuspected! And in the surgical treatment no less than *in* the recognition of these morbid growths the progress that has been achieved is a "positive something," to which the profession *may* proudly point as the best answer to sciolists and satirists who declaim against the advancing utility of our art.

The fact that intra-laryngeal growths are of far more frequent occurrence than has heretofore been generally believed, adds still greater value to the improvement in their diagnosis and treatment. The opinion on this subject, prophetically expressed by a member of this Association in 1852, has indeed been confirmed.[1] While the most diligent search through ante-laryngoscopal literature, embracing all countries from the most ancient times, yields hardly a hundred cases—Dr. Buck, being unable to collect, in the paper referred to, more than forty-two instances, including the only case that came under his own observation—there have been reported during the last five years more than fifty by Lewin, of

[1] "That foreign growths have occurred in the opening of the air-passages in many instances where their presence was neither suspected nor discovered, and that, if the attention of the profession should by any means be directed to this subject, it will be found that the existence of polypus and other excrescences in these passages is an occurrence taking place much more frequently than has been supposed by medical practitioners." Again, "There remains not a doubt that *in* many instances these morbid growths have existed unobserved during life, and, having proved suddenly fatal, have remained undetected after death." On the Surgical Treatment of Polypi of the Larynx and Œdema of the Glottis. By Horace Green, A. M., M. D., etc. New York: John Wiley, 1859, Preface, and p. 11.

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Berlin; more than forty by Türck, Czermak, Semeleder, and Störk, of Vienna; some twenty by Gibb, Walker, and Mackenzie, of London; quite a number by Moura-Bourouillou, and other physicians, of Paris; and many more by others in various countries. The eleven cases on which this essay is based have occurred in the writer's practice during the last three years.

In structure, these growths belong most frequently to what are called non-malignant tumors. Before the introduction of laryngoscopal practice, however, they were almost always of the utmost malignancy as far as the patient was concerned, for, as they ended fatally by obstructing the air-passage, it mattered little whether "benignant" connective tissue or "malignant cancer" suffocated the sufferer. (In Section IV. will be found the report of microscopic examination in several cases.)

In form, they are sometimes rounded, globular, or pear-shaped, sometimes nodulated or in clusters, granular or lobulated; very frequently they are pediculated, but sometimes they are sessile and conical, or irregularly flattened, cauliflower-like, or foliated, or they may appear as circumscribed thickenings of the surface causing abrupt elevations. Indeed, varying as they do in size from that of a pin's head to the bulk of a hazelnut, a walnut, and even longer, they assume all kinds of forms. The size of a pea is perhaps on the whole that most commonly observed.

They are most frequently found attached to the vocal cords, especially just above their anterior insertion, the ventricles, and inner surface of the epiglottis. They are met with far more frequently in the upper than in the lower cavity of the larynx, and, what is very curious, oftener on the left side than on the right. They occur more frequently in men than in women,[1] and though they occur at all ages, from the newborn to the aged,[2] they have been comparatively seldom found in very old persons.

As to the etiology of morbid growths, I would say here, without indulging in any speculations, from which I purposely debarred myself in choosing the title of this essay, that on examining the report of cases in Section IV., there will be found much reason for

[1] I am not aware that an explanation of this difference in the sexes has ever been given. The usually more active and energetic use of the vocal organ by men may fairly be presumed to exert some influence.

[2] Lewin diagnosed with the laryngoscope excrescences in a little girl, aged three and a half years, and successfully removed them by topical means. Deutsche Klinik, 1862, No. 25.

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agreeing with VIRCHOW in regard to the influence of local irritation and other factors as laid down in the most recently published second volume of his grand work on Pathology.[1]

Nor is it my intention to dwell in detail here upon the symptomatology, as this will be sufficiently illustrated in the account of cases following. Aside from the laryngoscopic examination, the means of diagnosis are:—

1. Alteration in voice, from slight hoarseness, or inability to produce certain notes, to partial or entire, intermittent or constant, aphonia.

2. Obstructed respiration, from occasional slight dyspnœa to frequent, on the slightest exertion induced, or constant, suffocative paroxysms: still more exaggerated by position, and, therefore, worst at night in bed, etc.

3. Cough, which in some instances "is slight and infrequent, in others very violent, and attended with a hoarse, croupy, or laryngeal sound, which is also sometimes whistling."[2]

4. Expectoration, usually of mucus which offers nothing characteristic.

5. Troublesome sensations in the larynx, as a sense of fulness, tightness, as of a foreign body, accumulation of phlegm, etc.

6. Embarrassed deglutition, varying from partial or entire inability to swallow solids or sometimes liquids to the most intolerable dysphagia.

7. Auscultatory phenomena, especially the "peculiar cluck or valvular sound" which, however, can be heard only extremely seldom.

8. Asymmetry of the larynx, as shown by external inspection and mensuration.

9. Direct inspection through the mouth by depressing the tongue, and bringing the top of the epiglottis into view.

10. Palpation from the outside, but more especially through

[1] Vorlesungen über Pathologie. Von Rudolf Virchow. Zweiter Band, Onkologie. Berlin, August Hirschwald, 1863. See especially: Vierte Vorlesung, Aetiologie der neoplastischen Geschwülste, p. 57; and Fünfte Vorlesung, Pathogenie der neopl. Geschw., p. 72.

[2] On the Surgical Treatment of Morbid Growths within the Larynx. By Gurdon Buck, M. D., Surgeon to the New York Hospital. Transactions of the American Medical Association, Vol. VI., Philada., 1853, p. 523. Dr. Buck also calls attention to Marshall Hall's test of breathing through the nostrils to determine obstructed respiration, p. 526.

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the mouth, "exploration of the orifice of the larynx with the end of the forefinger."

11. Expulsion of a portion of the tumor by coughing.

With all, the diagnosis has been a very uncertain one without the laryngoscopic examination. Small tumors never revealed themselves by any symptoms that might not have been owing to other affections, and even large ones rendered the diagnosis generally one of probability only.[1] The majority of the cases formerly placed on record were not recognized until after death; the precise form, size, and seat of attachment were in no instance known before *ante-* or *post-mortem laryngotomy*. Not counting a few exceptional cases, what Pelletan said in 1810 remained unchanged up to our own times, viz.: that such tumors "could neither be known or attacked, dissection alone could reveal them."[2] But with the use of the laryngoscope exact diagnosis has taken the place of error and accidentally correct guesswork. While Prof. Ehrmann in 1850 was still forced thus to lament: "It is true that the diagnosis of this insidious affection is surrounded by so much obscurity, that the danger often reveals itself only when it is no longer possible to escape it"[3]—at the present day it is generally just as easy for any one who has mastered the application of the mirror to diagnose a tumor upon the vocal cords as a wart on the finger.

And the prognosis has undergone a corresponding change. Dr. Buck says: "The prognosis in this disease, if left to itself, is almost necessarily fatal. * * * In the progress of the disease, when once suffocative paroxysms have become established, the danger of suffocation is imminent, and the catastrophe may occur at any moment."[4] Dr. Green says: "With regard to the fatal tendency of polypus of the larynx, but one opinion can be entertained;"[5] and Prof. Ehrmann: "From a view of all the cases yet observed, this conclusion is inevitable that polypi of the larynx, left to nature, become sooner or later the cause of sudden death."[6] Before the

[1] "The diagnosis of these excrescences is extremely difficult; the symptoms developed by their presence simulate those frequently observed in asthma, phthisis, œdema of the glottis, thickening of the mucous membrane of the larynx, and ulceration of the vocal ligaments." Horace Green, op. cit., p. 11.

[2] Clinique Chirurgicale, tom. i. observ. 8, p. 15.

[3] Histoire des Polypes du Larynx, par C. H. Ehrmann, Professeur, etc., Musée d'Anatomie de la Faculté de Médecine de Strasbourg. Strasbourg, 1850, cited by Lewin, Allgemeine Medicinische Central-Zeitung, Jan. 4, 1862, p. 10.

[4] Op. cit., p. 526.

[5] Op. cit., p. 95.

[6] Histoire des Polypes du Larynx, p. 1.

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introduction of the laryngoscope, not only was it often the case that "the sudden death of the patient was the first indication of the existence of the tumor,"[1]—but *all the attempts made to save the life of the sufferers in the fortunate instances in which the diagnosis was arrived at with more or less probability, were crowned with success only* SEVEN TIMES, *including in this number even the case of Dr. Buck, of which he himself says that "though not followed by the same happy result, yet the patient was rescued from impending suffocation, and her life prolonged for more than a year."* At the present day a laryngeal tumor is no longer beyond the reach of art: what before was the exception has become the rule. Though cases may be presented in which the laryngoscopic examination has become impossible from excessive dyspnœa from a very large tumor, it will generally be found that here the proper time for action has been simply allowed to pass unimproved. Such tumors usually grow comparatively slowly, and should not now easily entail death. (Lewin, *op. cit.*)

SECTION II.—OPERATIONS HERETOFORE PRACTISED.

I. REMOVAL AFTER TRACHEO-LARYNGOTOMY.—"If it were possible to ascertain the existence of a polypus in the larynx during life," says Ryland, "it would be the duty of the surgeon to attempt its removal by the knife, or by a ligature round its base." He states that "for this purpose it would be necessary to divide the cricoid cartilage, and probably the thyroid also;" but adds, "I am not aware of any case in which this operation has been undertaken."[2] Prof. Ehrmann was the first who successfully performed it,[3] and his report was not only very well received by the *Académie des Sciences*, but the *Scientific Congress*, which met at Aix-la Chapelle,

[1] Green, op. citat., p. 90. Speaking of other conditions as evidencing the presence of polypus, he also remarks: "But long before the disease shall have reached this stage, the life of the patient will be jeoparded, and may, indeed, be suddenly arrested by asphyxia, produced by some chance displacement of the tumor. * * * * It becomes then a matter of great importance to establish such other diagnostic symptoms as will enable us to detect, if possible, the existence of the disease, before it has advanced to this, its almost fatal stage." pp. 89 and 90.

[2] A Treatise on the Diseases and Injuries of the Larynx and Trachea; founded on the Essay, to which was adjudged the Jacksonian Prize for 1835. By Frederick Ryland, Surgeon to the Town Infirmary, Birmingham, London, 1837, p. 230.

[3] Laryngotomie pratiquée dans un cas de polype du larynx, par C. H. Ehrmann, Strasbourg, 1844.

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in 1847, listened to it with much interest, and the illustrious Stromeyer, who presided on the occasion, said the operation must be ranked among the most brilliant achievements of modern surgery. The following is a condensed account of the case: C. M., a healthy woman otherwise, 33 years old, first noticed a change in the sound of her voice some four years ago. This hoarseness, unaccompanied by any pain or difficulty in speaking, gradually and insensibly increased to aphonia. She was able, by a sudden inspiration and expiration, to imitate the sound of a valve alternately opening and shutting; and during deglutition it sometimes happened that portions of liquid swallowed would enter the larynx and excite violent fits of coughing. Several times she had thrown up little pieces which were, doubtless, portions of the tumor afterwards removed from the larynx.

Suddenly she felt, while in the street, extreme difficulty of breathing. After a few moments of repose at home, dyspnœa, agitation, and distress increased, and suffocation became momentarily imminent. The operation for her relief was performed as follows:—

"I had the patient placed in an arm-chair, the head being thrown backward and properly held. I divided the tissues of the anterior and middle part of the neck, commencing the incision at the point corresponding to the crico-thyroidean space, and carrying it in the median line toward, and near to, the border of the sternum. I successively separated in this manner the skin, the subcutaneous cellular tissue, the crico-thyroidean membrane, the cricoid cartilage, and the first two rings of the trachea. The small amount of blood which found its way into the air-tube was soon rejected by expiration, which, from the division of the parts, was made with much facility, to the great relief of the patient. A curved canula of the size of the little finger was immediately placed in the wound in the respiratory tube, and confined by the aid of strong ribbons.

"The inexpressible relief which the patient enjoyed, and the need she felt for rest, after having endured, for nearly three hours, the agonies of death, decided me to postpone to another time the incision of the larynx, and the removal of the foreign body which was developed there. To this delay may be attributed, in a great measure, the success of the operation.

"The irritation of the mucous membrane, produced by the contact of the canula, caused an abundant mucous secretion, which

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was ejected by a cough quite fatiguing. Otherwise there was nothing to be desired as to the state of the patient; and at the end of forty-eight hours from the first operation, the time seemed favorable for performing laryngotomy. In this I was assisted by Drs. Schmidt and Aronssohn.

"In order to be able to prolong, properly, the incision previously made, I had the canula pulled down and the vocal tube kept stretched, and after having determined by the touch the line formed by the union of the halves of the thyroid cartilage, and also that of its superior border, I continued the incision upwards in the line indicated, as far as the hyoid bone. The blood being carefully sponged away, and the halves of the larynx separated, we discovered the polypous excrescence, implanted along the left vocal cord. With one hand I seized it, by the aid of dissecting forceps, and with the other armed with a bistoury, I excised it, and thus removed it in three portions, which, reunited, formed quite a voluminous mass. The whole of this tumor resembled in form that of a small cauliflower, presenting here and there, upon its surface, granulations round and fleshy."

As soon as the bleeding was arrested, the two cut edges of the thyroid cartilage were carefully reunited. The dressing consisted in the application of a little charpie between the lips of the external wound, brought together by means of adhesive straps. The patient was placed in bed, all movement prohibited, and absolute quiet enjoined. From time to time she took a little sugar-water, which she swallowed without difficulty. The canula was removed on the third day; and twenty-one days after the operation the parts had entirely united, while eight days later already the wound in the neck had also completely cicatrized. The patient could breathe freely, but the aphonia remained.

The same operation was repeated twice, with slight modifications, by Dr. Buck, and though not followed in his case by the same success, "it will doubtless be conceded that the prolonging of the patient's life for fifteen months was no unimportant achievement." The particulars of this interesting case I need not give here, as they are published in the *Transactions* of the Association for 1853.

With the exception of one other case operated upon in St. Luke's Hospital, after a laryngoscopic examination had revealed the presence and precise seat of the tumor, by Dr. Sands, Prof. Ehrmann's

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operation does not seem to have found imitators. Its advantages are that the patient can recover from the dyspnœa before laryngotomy is performed; that by means of the tube, respiration may be maintained, the parts for the second operation uniformly stretched by its depression, and blood prevented from entering the cavity; that the larynx may be examined, and the tumor extirpated at comparative ease; and that the tube, after the extirpation, allows of rest to the vocal organ, and prevents the contact of air to the tissues from which the growth has been removed.

Its disadvantages are that it is always a serious and uncertain operation; and that the liability of injuring nerves and muscles and even the vocal cords themselves, followed by incurable aphonia, is inseparable from it.[1] In cases of tumors in which loss of voice is a principal question, it could therefore never be indicated. Indeed it can be justly performed only as a last resort to save life if no other means should succeed.

II. Removal after Subhyoidean Pharyngotomy.—This operation is the "*Laryngotomie sous-hyoidienne*" of Vidal and Malgaigne. Vidal de Cassis recommended it in cases of abscesses and infiltrations of the connective tissue at the base of the epiglottis; and Malgaigne described it to consist in an incision along and parallel to the lower edge of the hyoid bone, through the skin, the fascia, the hyo-thyroid membrane, the inner half of the sterno-hyoid muscle and the mucous membrane between the root of the tongue and the epiglottis; but neither of them had ever performed it on the living subject. The first and so far the only time this operation was practically tested has been by Prat,[2] who successfully removed by its aid a fibroid tumor from the back of the epiglottis. The details of this case were as follows: Mr. M., an American, who had for a long time suffered from dysphagia which resisted all internal and local treatment, gradually became affected also with difficulty of breathing. Finally the difficulty of swallowing increased to a veritable *aphagia*. The tumor could be felt with the finger per orem, but all attempts through the mouth to catch hold and excise it failed. The patient, who could neither eat nor drink, insisted on being relieved, and Prat operated according to Malgaigne's directions. The transverse incision, 2–3 millimetres long,

[1] "Either directly during the operation, or during the healing process by contraction and cicatrization of other parts." Bruns, op. citat.

[2] Gazette des Hôpitaux, No. 103, Paris, 1859, p. 409.

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brought him down to the epiglottis, upon the left side of the laryngeal surface of which the tumor was found, attached several millimetres distant from the upper angle. The tumor looked into the pharynx. Prat seized it with a kind of forceps and excised it with a pair of curved scissors. It was found to be hard, dense, fibrous, of grayish-white color. No vessel required ligation; the edges of the wound were united by three sutures, and a rather tight dressing was applied. The wound healed perfectly well, and the patient's troubles of respiration and deglutition disappeared.

Lewin, in his most excellent lecture before the Berlin Medical Society,[1] dwelt at great length upon this operation, and I cannot but agree with him that it should be and will be more frequently performed in the future. It involves least important structures. The laryngeal artery, veins, and nerve run so deeply along the upper edge of the thyroid cartilage that injuring either of these is almost impossible.

Hyrtl[2] makes numerous objections to the operation. He evidently knows nothing of Prat's case, and seems to think that the cavity of the larynx cannot thus well be reached. But on seizing the epiglottis and turning it forward, or drawing it out of the wound, according to Malgaigne's directions, there is nothing to prevent our inspecting or operating in the larynx. Lewin has very justly, however, raised the point of the variation of relations between the position of the tongue and epiglottis. As the insertion of the latter varies, it may happen that the incision pass through the base of the epiglottis. Quite recently I had an opportunity to verify this observation on the dead body. The occurrence of such an accident would frustrate the object of the operation: the inspection of the larynx would be impossible, and the wound far more serious than the operation otherwise is. Careful palpation of the hyoid bone outside, and the insertion of the finger—as far down as possible—through the mouth will, in most cases, approximately at least, determine the relative positions. For very sensitive patients, who cannot be educated to bear the finger so deep in the fauces, I recommend partial anæsthesia. In the few cases in which the top of the epiglottis is to be drawn out through the wound, the patient may also be chloroformed.

[1] Beiträge zur Laryngoskopie. Über Neubildungen, namentlich Polypen, im Kehlkopf. Vortrag gehalten am 4. Dec. 1861 vom Dr. Georg Lewin. Published: Deutsche Klinik 1862, No. 13 et seq.

[2] Handbuch der topographischen Anatomie, Bd. I. p. 466.

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The indications for performing this operation are, according to Lewin: 1. Tumors between the epiglottis and root of the tongue (in the valleculæ and on the glosso-epiglottic ligaments) when attempts to remove them by way of the mouth fail; 2. Tumors on any portion of the epiglottis itself; 3. Growths on either of the ary-epiglottic folds, the posterior surface of the arytenoid cartilages, the superior surfaces of the ventricular folds, or the lower projecting portions of the posterior wall of the larynx.

Semeleder has suggested that if the incision be made at one side instead of in the middle, although it would become more difficult to avoid injuring the superior laryngeal artery and nerve, an incision only 1 to 1½ inch long would give us a very good view of the ventricular fold and vocal cord of the opposite side, and allow of the introduction of instruments for surgical purposes.[1]

Cases may occur also in which it would be advisable to precede the sub-hyoidean pharyngotomy (or, as it is incorrectly called, laryngotomy) by the operation of tracheotomy to maintain uniform respiration, etc.

III. Removal through the Oral Cavity.—Before the introduction of the laryngoscope this has been accomplished four times. The combination of circumstances which is an indispensable requisite for its possibility naturally presents itself but very rarely; the four cases possess much practical as well as historical interest, and are highly creditable to the operators. How much these would have been aided by the laryngeal mirror is obvious.

A. Excision by the Knife.—Miss K., 11 years old, was first seen by Dr. Green at the age of 3 years, when the parents had noticed a change in the tone of the child's voice, and a slight embarrassment in her respiration. With intervals of seeming improvement these symptoms increased in spite of the excision of hypertrophied tonsils until she was found in the following condition: Countenance expressive of anxiety; voice hoarse and uneven, at times nearly aphonic; respiration difficult; the eyes appearing prominent; the chin raised, and the head thrust a little forward, as if that position afforded some relief to the dyspnœa; suffocative paroxysms were very frequent, and at times very severe; and the patient appeared under great nervous excitement, as if constantly apprehensive of danger. After baffling him and others for a

[1] Semeleder, op. cit., p. 60.

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long time, the doctor was once examining the epiglottis by greatly drawing forward and depressing the tongue, when the patient gave a sudden and rather violent cough, and a round, white, fibrous-looking polypus appeared, momentarily, and then seemed as quickly to be drawn again into the larynx. Again and again this was repeated, and whenever the patient coughed at the moment the tongue was depressed, a portion of the polypus could be seen, not over the top of the epiglottis exactly, but at the left lateral border. The mobility of the tumor was quite manifest. It appeared to Dr. Green to be attached by a pedicle to the left ventricle or left vocal ligament, because "on coughing the current of air would force the body out of the glottis sufficient to allow a portion of the tumor to be seen on the side of the opening, just above the tip of the left arytenoid cartilage." The doctor procured the instruments he employs for excising tonsils, viz.: a slender double hook, with a long handle, and a probe-pointed knife, with a strong handle and a delicate slender blade. The description of the operation he himself gives as follows: "The nature of the operation desired to be practised, and the part to be performed by the patient were all explained to this intelligent young lady. She was seated in a good light, before an open window, with her head thrown well back, and held firmly by an assistant in that position. With the flat handle of my knife I depressed the tongue, and when the epiglottis was in view I glided the double hook over the top of this cartilage, and a little on its laryngeal face. This operation caused the patient to cough; the tumor was again brought into view, and I endeavored to catch it with the hook, but it was so quickly drawn back into the larynx that I failed to do it; and after making several ineffectual attempts thus to fish up the polypus, I was obliged to desist for a time to allow the patient to rest.

"After a short period we were able to renew our efforts, and at the second or third attempt, I succeeded in catching the hooks into the top of the tumor, and turning quickly the blade of the knife downwards passed it over the left border of the glottis, and carrying the blade nearly an inch into the glottis, I cut from behind forwards, and, happily, dividing the pedicle near its attachment brought the entire tumor out of the larynx.

"Some coughing followed this operation, and a few drops of blood, mingled with mucus, were expectorated, but the irritation soon subsided, and on speaking the patient's voice was found to be greatly improved. Some degree of hoarseness remained for a

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time, but this soon passed away; the voice became strong and clear; the embarrassed respiration, the cough, the anxiety of countenance, and, indeed, all the unfavorable symptoms rapidly disappeared, and Miss K. has for several years enjoyed excellent health.

"The polypus was nearly round, being a little oblong, and of the size of a cherry. It was quite smooth, was covered by a mucous membrane, and presented all the characteristics of a fibrous tumor."[1]

B. REMOVAL BY THE LIGATURE.—Two cases were thus operated upon, viz., by

1. *Simple Ligature.*—This is the case of Koderik, of which but little is known. Lewin gives the title of a work in which it is, perhaps, he thinks, described in detail. I have, in spite of considerable trouble, also been unable to obtain access to a copy of this work.[2] From a review of it, Lewin extracts the following passage: "A laryngeal polyp, which Levret could not ligate with his instruments, was ligated with much ease by G. Koderik, a surgeon of Brussels, by means of an instrument which consisted of a series of hollow balls. This flexible instrument may, perhaps, in certain cases in which the inflexible cylinder fails, be very serviceable."[3] An instrument which he had constructed after the drawing, which accompanied this notice, he has had no opportunity of testing practically as yet.[4]

2. *Galvano-caustic Wire.*—This is the well-known case of Middeldorpf.[5] Mr. M., a clergyman, 42 years old, after suffering for some time with various difficulties referred to the larynx, became subject to suffocative attacks. He could protrude his tongue, and hold it so concavely at the very floor of the oral cavity, that the epiglottis became visible to himself and others; and a pale pink, dirty sulphur-yellow tumor, covered with here and there abraded mucous membrane, of the supposed bulk of a large walnut, was then seen just behind the epiglottis. The coughing up on four different occasions, of portions of the growth, left no doubt as to

[1] Green, op. citat., pp. 56 to 65.

[2] George Herbinaux, Parallele des differens Instruments, avec les méthodes de s'en servir pour pratiquer la ligature des polypes dans la Matrice, en forme de lettre à M. Roun; avec figures. A la Haye chez Gosse et Perol., 1771, 8vo. p. 128.

[3] A. G. Richter's Chirurg. Bibliothek, II. Bd., 1 Stück, p. 72.

[4] Lewin, op. cit., Allgemeine Medicinische Central-Zeitung, 1862, 5. Stück, p. 34.

[5] Middeldorpf; Die Galvano-caustik, Breslau, 1854, p. 212.

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the correctness of the diagnosis; but whether the tumor was attached to one of the vocal cords, or in some other locality, had to remain a matter of conjecture; for although Prof. Middeldorpf was able to introduce his finger into the larynx sufficiently to make out the form and consistence of the tumor, and also the fact that it was situated a little to the right of the median line, he could not reach its base. The tongue was held by a Museux's forceps; the galvano-caustic wire, introduced between the epiglottis and tumor, was made to grasp the tumor as near its attachment as possible by means of the tube and fingers, and drawn tight; the conducting wires were attached, and the growth excised.

When removed, it weighed 8½ grm., was 44 millim. broad, and 20 millim. thick. The respiration became more free and was no longer audible, cough disappeared, swallowing became normal, the patient could sleep soundly, and soon recovered strength. In the course of three weeks his voice also improved. But the tumor had not been excised at its base; a stump remained plainly perceptible to the finger. Although, therefore, the prognosis was very doubtful, both because the stump might cause a fatal termination if it should obstruct the rima glottidis, and because a return of the tumor was so very likely, yet Rühle reports that he has examined the patient and found no traces of a return, 6½ years after the operation.[1]

C. REMOVAL BY THE PROBANG.—W. J., aged 42 years, a lawyer, nearly three years ago began to experience, after exposure to cold and wet, some soreness in the throat; a huskiness of the voice, and a slight dry cough supervened, which he thought proceeded from an irritation in the upper part of the windpipe. The hoarseness steadily increased until his voice was extinguished, and some embarrassment of respiration also gradually appeared. When he presented himself to Dr. Green, "his disease, whatever its nature, had not made much inroad upon his general health. His complexion was very sallow; he complained of some debility, and of pain, and a feeling of constriction in the region of the larynx. Respiration, ordinarily, was quite difficult; but on making any exertion, as in ascending a slight elevation, or a flight of stairs, it

[1] Die Kehlkopf-Krankheiten. Klinisch bearbeitet von Dr. Hugo Rühle, ord. Professor der Medicin, Director der medicinischen Klinik an der Universität Greifswald. Mit 4 Kupfertafeln. Berlin, August Hirschwald, 1861, p. 229.

It may be added that, at first daily, and afterward less frequent applications of a strong solution of nitrate of silver were made to the stump of the growth remaining.

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became greatly embarrassed, and was attended with a hissing sound. Deglutition was performed with considerable difficulty. Complete aphonia existed, but it was aphonia of a peculiar character," *i. e.*, "it was necessary to place the ear close to the mouth of the patient to be able to understand a word he uttered; and even then it was difficult, as the voice sounded veiled, or as if it was passing through moistened gauze." The uvula was found hypertrophied, and the pharyngeal mucous membrane vascular with enlarged follicles; the former was truncated, and daily applications of a strong solution of nitrate of silver were made to the latter, and to the lingual and laryngeal faces of the epiglottis. Five grains of iodide of potassium were also given internally twice daily. After some time the throat presented a healthy aspect, but dyspnœa and aphonia were unchanged. There was an interval of six weeks, during which Dr. Green did not see his patient. When he visited him again, an unfavorable progression was unmistakable; respiration very difficult; voice entirely lost; pulse frequent and quite feeble; cough increased; all the symptoms indicated imperfect aeration of blood—the windpipe was evidently obstructed. There were no intervals of comparative ease, nor any sudden and violent seizures threatening immediate suffocation. A stronger solution—about a drachm to an ounce of water—was now carried by means of a small sponge probang into the larynx, but the sponge could not be passed through the rima glottidis. After three or four days of such attempts, Dr. Green says he took a probang, a size smaller than the previous one, and on reaching the vocal cords he made a slight pressure, when the instrument passed into the trachea. On withdrawing it, several small bodies were observed attached to the sponge, and the patient coughed and brought up into his mouth several more of these—all of which proved to be small polypi, of the kind usually denominated vegetant or cauliflower excrescences. They were of different sizes, varying in volume from that of a millet-seed up to the size of a large duck-shot. Under a magnifying glass each showed the characteristics of a perfectly formed polypus, being covered with a mucous membrane, and having a delicate pedicle, by which it was attached to its base. These applications of the probang were now continued daily for two weeks longer, and nearly every time when the instrument was passed below the vocal cords more or less of these small excrescences were brought away for twelve or thirteen days. After this time no more came away; the whole number dislodged exceeded thirty. The patient's respira-

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tion became comparatively easy, his cough abated, and general health improved, but he remained aphonic—although his whisper lost the hissing character, and could be heard distinctly across a large room. Four years later he still conversed, ordinarily, in a strong whisper, and was only able by exertion to speak aloud.[1] It would be highly interesting to have examined this gentleman laryngoscopically.

In commenting upon this case, Dr. Buck very properly calls attention to the fact that, though there existed dyspnœa and aphonia, there were no suffocative paroxysms. "Where this latter symptom is present (and it is very seldom absent), danger of suffocation would be greatly enhanced by the application of caustic."[2]

After having performed Ehrmann's operation, Buck also recommends cauterization, thus: "Should it be found impracticable, after exposing the laryngeal cavity, to remove the entire disease, I would advise a thorough cauterization of the morbid growths with the acid nitrate of mercury, before closing the wound. After this, the application of the dilute acid nitrate, or a strong solution of nitrate of silver, may be repeated by the mouth, for the purpose of completely destroying the disease, or at least of repressing its growth."

SECTION III.—THE SURGICAL TREATMENT OF TO-DAY.

In a therapeutical point of view there is at the present day hardly a more thankful task than the local medication of laryngeal affections; and the treatment of an intra-laryngeal morbid growth now-a-days constitutes in its effects upon the patient, frequently, a truly wonderful achievement. The difference between the treatment of to-day and that heretofore practised is that we need no longer (to use an expressive though perhaps too vulgar phrase) "go it blind." —"Whereas before we saw not, now we see."

[1] Green, op. cit., pp. 66–74.

[2] Buck, op. cit. He adds: "For the greater safety of the patient, tracheotomy should be performed as a preliminary to the use of caustic. In every case in which a trachea-tube is inserted, the tube should be perforated with a large opening on the convex side of its curve, in order that, by closing its outer orifice, the patient may at pleasure use his voice, and expel sloughs and other discharges from the larynx when caustic applications are being made." Such openings do, however, frequently cause great mischief, as in the recent case of Dr. Sayre, *American Medical Times*, February, 1864, and another sent to me by Dr. Sayre, which is still under treatment; and perforated trachea-tubes should *never* be used, I think.

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The *Indications* that present themselves are—

1. To prevent the occurrence of laryngostenosis;
2. To avert its dangers when it has already occurred;
3. To restore the proper functions of the larynx.

The first can be fulfilled by either arresting the further growth of the tumor, or removing it; the second by removing the tumor or making it harmless by performing tracheotomy; and the third cannot always be fulfilled by the removal of the tumor, but certainly not without. Changes of position and absolute rest of the patient, forcible inspiration and expiration, attempts at swallowing, severe coughing and vomiting artificially induced, avoidance of exposure, and careful regulation of the habits, occupation, etc., are expedients sometimes very serviceable. Occasionally the question of a sixteenth of an inch more or less width of the rima glottidis is the *immediate* question of life or death, and in such a case tracheotomy is imperatively demanded. But the only radical cure possible is removal of the tumor. This may be accomplished by (*a*) chemical or (*b*) mechanical means.

I. CAUTERIZATION.—There is but a single case known in which, previous to the introduction of the laryngoscope, an intra-laryngeal growth was removed by cauterization. This case I have described on page 673, and even here the probang itself was probably the really effective agent by mechanically tearing loose and bringing away the small polypi. But at the meeting of German Naturalists and Physicians at Speyer in 1861, Dr. Knauff, of Heidelberg, is said to have presented the report of a polypus, the existence of which had been placed beyond doubt by laryngoscopic examination, which had rapidly disappeared after cauterization by once inhaling powdered nitrate of silver.[1] As we are enabled, however, to apply, with the laryngoscope, caustic directly to the spot necessary to be touched, entirely avoiding surrounding healthy structures —without dwelling in detail upon either the ineffectual character or the very injurious consequences of such indefinite cauterizing recorded by several observers, *I condemn most strongly all attempts at destroying morbid growths in the cavity of the larynx with caustic*

[1] Lewin, op. cit., Deutsche Klinik, 1862, No. 23, p. 226. As Dr. Lewin was present, I presume he is right as to this case, although I find in the Report of the Meeting that the polypus was frequently cauterized, first shrank and then came away spontaneously. See f. i. Schmidt's Jahrbücher, 1862, No. 6 (Bd. 114, Heft 3) p. 400.

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applied with the probang or syringe, by insufflation or inhalation, or by any other mode whatever, unless such attempts are made by the aid of the laryngeal mirror. Indeed, without using "the eye to guide and control the operating hand," or at least without having ascertained by means of a laryngoscopic examination, the condition of the parts beforehand, no application to the delicate structures of the vocal organ is advisable for any purpose. Dr. Gibb properly remarks that "it may become a medico-legal question hereafter, whether any one is justified in introducing a probang into the larynx without first ascertaining the position of the epiglottis."[1]

Cauterization is indicated for tumors, 1, of fresh growth; 2, small size; 3, soft consistence; 4, sessile attachment; 5, in cases in which removal by cutting instruments is impracticable or unadvisable, as may happen f. i. sometimes with tumors upon the vocal cords, or when considerable hemorrhage is to be anticipated. Lewin and others recommend always to try cauterization before proceeding to extirpate with cutting instruments, urging as a reason that it is certainly possible that the object may be attained by this means; but even if not, the irritability of the organs involved is thereby reduced and the patient learns to hold his tongue properly, and altogether to place himself, especially his pharynx and larynx, in such a position that the chance of success of the subsequent operation is increased. Now, while it is true that the organs involved and the patient usually do require more or less "educational preparation" (of which I shall soon speak at greater length) it is not best always to cauterize for "practice;" for, not only can it often be determined pretty accurately beforehand that the caustic will do no good in a special case—more particularly because, as Semeleder justly observes,[2] "it is not possible to cauterize in the larynx so strongly that the caustic can act also mechanically, as we ordinarily do where we want to destroy tissue, on account of our having too little time and the parts being too movable,"—but I have in several instances known it also to do harm, for "a superficial cauterization produces in many cases rather a more rapid growth than shrinking of neoplasmata."

The instruments with which the various caustics are to be conveyed into the larynx are the laryngeal porte-caustic, brush, sponge-carrier, insufflation tube, fumigation tube, and forceps. These,

[1] Diseases of the Throat and Windpipe, 1864, citat., p. 54.
[2] Op. cit., p. 60.

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except the last, may be presumed to be so well known as not to need here any detailed description.[1]

The forceps which the instrument makers, Otto & Reynders (58 Chatham Street, New York), made after the pattern of Von Bruns' epiglottis forceps,[2] only with longer arms, and the fangs made so that they can carry and instantly deposit a solid little particle, is most useful.

The individual caustics and astringents mostly employed, as seen in the report of cases (see Section IV.) are, nitrate of silver, both solid and in solution, acetic, tannic, chromic, and other acids; iodine, caustic paste, some preparations of mercury, especially the acid nitrate, and preparations of zinc.

Most patients require some preparation. By frequent introduction of the mirror, excitability at the back part of the mouth is usually soon lessened; at the same time the patient must be taught to open his mouth as wide as possible, protrude his tongue and control its movements. By practising several times every day with his own finger, first on the tongue and gradually on the deeper parts, until he can touch, and draw forward, and keep flat upon the root of the tongue, the epiglottis, a willing patient overcomes all irritability most quickly. Then, sounds should be introduced into the laryngeal cavity to touch the tumor, moistened sponge *not charged with caustic*, etc. As far as my own experience goes, I must conclude that the more urgent the necessity for interference is, the more certainly and quickly can we manage to gain access to the parts. (In cases of absolute urgency demanding tracheotomy, this must of course be performed with as little delay as the circumstances admit of.) But, very frequently, difficulties encountered and ascribed to the sensitiveness of the organs involved and the want of preparation of the patient, are in fact owing to the want of preparation, properly so called, of the operator. What Czermak in the earliest monograph on the subject said of the laryngoscopic examination, is still more applicable to all laryngoscopal operations.[3] Holding the mirror in the left and an instrument in the right hand, the operator must acquire "the habit of

[1] See Transactions of the American Medical Association, vol. xiv. 1863, p. 307; also Laryngoscopal Medication. By Louis Elsberg, M. D. New York: William Wood & Co., 1864, p. 27 et seq.

[2] Described and figured on Plate III., Fig. 30, op. cit., p. 75. See this Essay, Fig. 5, p. 686.

[3] "Diese Schwierigkeiten und Hindernisse liegen theils * * * * * und zwar *ganz besonders* in der Ungeübtheit und Ungeschicklichkeit des Beobachters." Der

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moving the hand in obedience to the will by indirect vision, *i. e.*, the ability of carrying an instrument directly, boldly, delicately, and firmly, without touching neighboring parts—to a point indirectly seen, *i. e.*, seen in a mirror." The difficulty of appreciating distances and the direction of movements is also gradually overcome by practising on a model.[1]

The subject of anæsthesia during operations in the larynx, has engaged the attention of laryngologists from the first. The bromide of potassium, which Huette, Rames, Riemschlagh, and others recommended very highly in the dose of one to two grammes, taken internally every hour, and which was said positively to possess "the property of producing insensibility of the pharyngeal region,"[2] is by no means reliable. In one case I found it to act remarkably well, in others not at all. Of bromide of ammonium, which Gibb has prominently brought before the profession,[3] I must say nearly the same thing. The nebulized cold alum water which Tobold[4] employs, has unquestionably a temporary influence over the part it touches, but leaves much to be desired; and I have obtained better results with nebulized solution of tannin, and with ice locally. Türck's local laryngeal anæsthetic, which consists of morphiæ sulph., gr. iij, dissolved in concentrated acetic acid, ʒj, mixed with chloroform, ℥ss, produced so much inflammation in the first case in which I tried it, that I have never used it again. Others seem to have accomplished something with it, however; it is said never to have produced any ill-consequences, the local inflammation usually subsiding in three or four days, and the parts being insensible in the mean time; though in my case I was forced to postpone all manipulation, even the slightest touch, for several days. As we do not, therefore, as yet possess a reliable local anæsthetic, general, complete, or partial, anæsthesia has been

Kehlkopfspiegel und seine Verwerthung für Physiologie und Medizin. Eine Monographie von Dr. Johann N. Czermak, ord. Professor der Physiologie an der K.K. Universität in Pest. Leipzig, 1860, p. 11.

[1] The plan recommended by many, of practising on a wax or other model is extremely valuable. The best mode of procuring a proper model is to mount a skull with open jaw and attach a larynx, tongue, etc., cut out, if possible, from a human subject.

[2] Gazette des Hôpitaux, 1860, April 21st.

[3] London Lancet, Medical Times and Gazette, and other periodicals, as well as op. citat.

[4] Lehrbuch der Laryngoskopie und des local-therapeutischen Verfahrens bei Kehlkopf-krankheiten von Dr. Adelbert Tobold, Sanitätsrath und praktischer Arzt in Berlin. Berlin, 1863, p. 79.

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tried by many. There are many objections to complete anæsthesia with chloroform for the purpose under consideration; but "a few whiffs of the latter" are generally unobjectionable and serviceable. This is the plan I follow whenever I think "chloroforming" necessary, and to this Gibb also gives the preference.[1]

Unless the patient has attained a very great degree of control over himself, it is necessary to support his head immovably in the proper position during the operation. This may be done by trustworthy assistants. After Lewin's example, I had for a long time been using in absence of assistants a stand such as photographers use to steady the head, until I obtained a "head holder" devised by Tobold to be attached to the operating-chair. This I find very convenient both for myself and patients. It is simple enough in its construction; an idea may be formed of it by imagining the head-piece of a barber's or dentist's chair to be a broad ring movable in all directions.

Firmly to hold out the protruded tongue, various appliances have been invented, but not one is generally applicable. Unless in rare exceptional cases, no instrument should be used, but the patient must learn either to protrude his tongue sufficiently and hold it in the proper position unaided, or his own hand (or the operator's, or an assistant's, especially in children) may thus hold it. With a very muscular tongue that cannot otherwise be excurvated or flattened, a strong spatula either with or without "mouth-keeper" is best.[2]

To hold the epiglottis with a forceps such as that of Bruns, already spoken of, or any other, I have never found advantageous. The operator's or the patient's forefinger usually suffices to raise it, and, if in spite of previous education with sounds, etc., it is necessary to carry an instrument on the laryngeal face of it, besides the operating instrument, during the operation, which will be the case but extremely seldom (it never having happened to me that either the finger, properly applied, or the caustic carrier, or other operating instrument was insufficient), a prolongation of the finger, such as Lewin's thimble, would be, I doubt not, very serviceable.

Like others, I have made use of some means of fixing the laryngeal mirror in the patient's mouth, and had quite an efficient "mirror holder" attached to my spatula. But I have given up its employment in operations such as are described in this essay. The operator's left hand (or right, if he choose to operate with the left)

[1] Op. cit., p. 141. [2] Elsberg's "Laryngoscopal Medication," cit. p. 10.

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or an *extremely able* assistant are the only "laryngoscope holders" admissible.

As to the mirror itself I prefer *glass*, covered with pure silver and thereupon either metal, wood, or ivory. Its precise shape matters little, so that it is large enough, and can be introduced and held properly. Frequently, when I could not obtain a good artificial light, I have found advantage from using Wintrich's double mirrors, by which we can avail ourselves of the multiplication principle of light.

The rays of the sun, whenever they can be made use of, are incomparably best for illumination, directed into the oral cavity by means of either a plane or an ordinary toilet mirror. A calcium light, or even gas or kerosene oil light, properly managed, is perfectly sufficient, however, besides allowing of invariable constancy and convenience. To concentrate the light of my kerosene lamp I use a system of lenses with reflector, arranged for me by the late Mr. Fitz, telescope maker of New York City, and, in connection with an Argand gas-burner, I use Tobold's apparatus, adapted for the purpose by Mr. Bogert, gas engineer. This is quite portable; a little pot to heat water is attached to it; it is very easily adjustable, and altogether leaves nothing more to desire. The illuminating mirror I attach sometimes to the spectacles of Semeleder; more rarely to the forehead band of Weiss (the celebrated London instrument maker's, which is in fact the improved plan of Czermak's laryngoscope); generally I have it held by a separate stand or the foot or bar of the lamp, as Türck, Voltolini, Lewin, Tobold, and others, have recommended before me. The focal length of the reflector should be from six to ten inches.

The distance at which the patient should sit from the operator should be such that the posterior wall of the pharynx, when the mouth is well opened and properly illuminated, is at the point of the most distinct vision of the operator; the patient's body should be erect, or a little bent forward and the head as slightly backward. A protecting towel or oil-silk cover should be fastened around the patient's neck, and extended over both him and the operator. I have also a spittoon attached to my operating chair.

I need not here dwell upon the care required in introducing with the left hand the mirror (previously warmed to prevent its being tarnished by the breath), and holding it so as to show the tumor best; upon the directions to be given to the patient in each special case to facilitate the operation, or upon the still more difficult task

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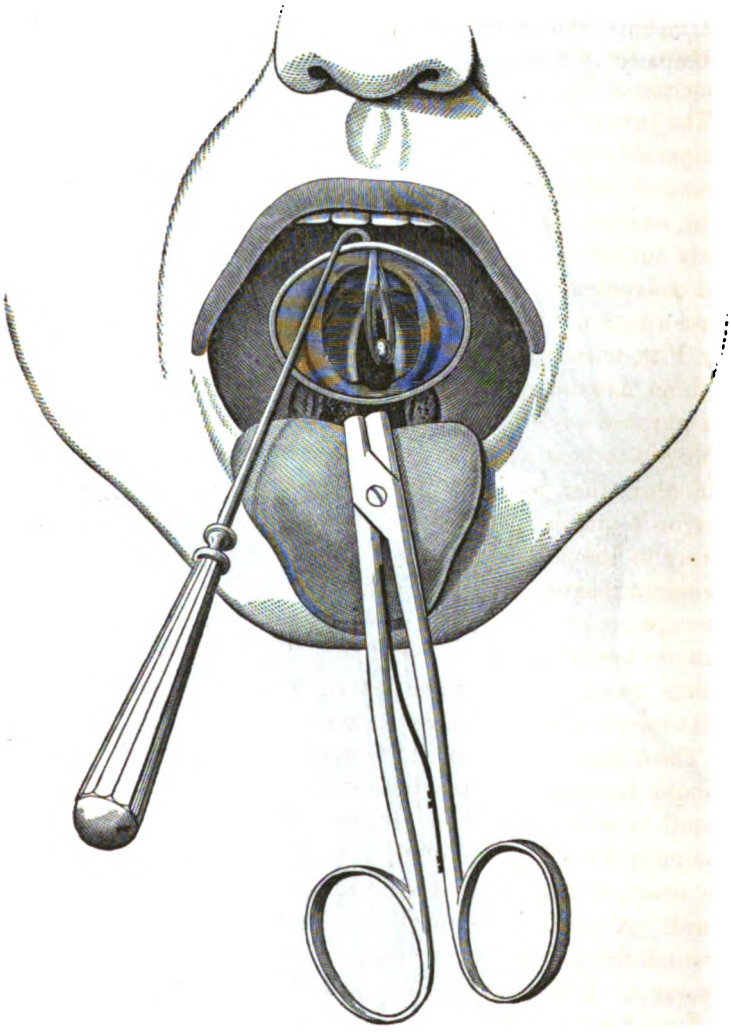
of carrying the caustic holder in the right hand safely beyond the epiglottis and accurately to the tumor. Lewin's description of his mode of proceeding still holds good: "With the point of the in-

Fig. 1.[1]



strument I pass, without touching any portion of the pharynx or epiglottis, to the neighborhood of the cords. Without touching, I rest here a moment to give the instrument its proper position to-

[1] See Case X., page 707; also Fig. 25.

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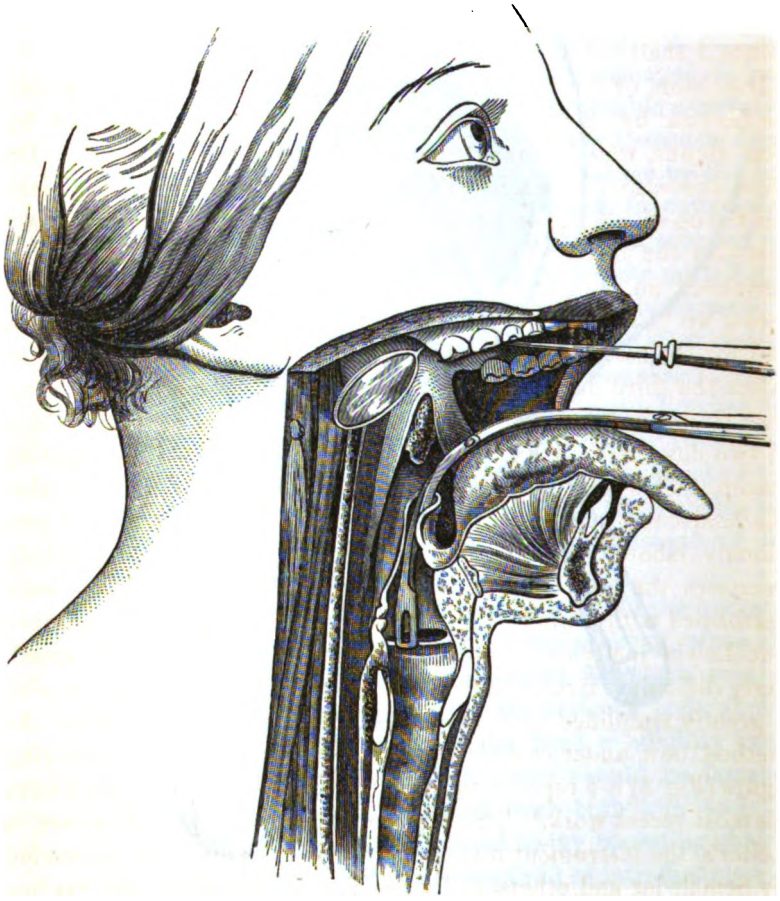
ward the polypus. The patient, who has already inspired profoundly to raise the epiglottis, inhales air once more, then holds his breath so that the various parts do not move much, while I instantly, without coming in contact with intermediate or adjacent parts, touch the polypus."

As the same description answers for the introduction of cutting instruments, the front and side view of the parts, given in the accompanying figures (Figs. 1 and 2), in which the mirror is seen

Fig. 2.[1]



to be introduced into the fauces, and my polyp-forceps into the larynx, will be sufficient to give an idea also of the introduction of the porte-caustic.

[1] See Case X., page 707; also Fig. 25.

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That the operation is not the easiest in the range of surgical practice is obvious; the good effects sometimes following simple cauterization in cases of morbid growth are illustrated in the report of cases, Section IV.

II. DISCISION.—All instruments designed for intra-laryngeal operations must, of course, have the proper size, bend, and construction, so that they can be passed directly down into the cavity, and that the cutting, or otherwise operating, portion can be easily brought into contact with the tumor to be operated upon; nor does the same size and bend exactly suit all individuals. To these two points I shall not again allude.

Discision, or the method of extirpating a morbid growth within the larynx by repeated incisions, has first been accomplished by Von Bruns, who has made it the subject of a monograph.[1] On three successive days a number of small incisions were made into the tissue of a polypus attached below the left vocal cord. On the first day the bleeding was comparatively profuse; the patient experienced no pain at all; for about three-quarters of an hour he threw up blood with coughing, amounting, perhaps, to two ounces, and for the rest of the day he hawked up a little more with phlegm. After the third day the polyp began to look like necrosed connective tissue, and was rapidly disintegrated and thrown off, so that in two days more it had all disappeared but a little suppurating stump. This gradually cicatrized and shrank still more, so that the hoarseness and acantophonia, under which the patient had previously labored, entirely disappeared. With all the preparatory exercises the treatment lasted two months. The discisions were performed with a kind of scissors—a very ingenious instrument—but Lewin justly criticizes it as rendering the operation exceedingly difficult. Bruns himself has since operated by excision with a greatly simplified instrument, which may also be used for the method now under consideration, and of which the accompanying figure (Fig. 3) is a representation (of almost natural size) taken from his most recent work.[2] The best knife for this purpose, however, is Leiter's, the instrument maker's of Vienna. This is recommended by Semeleder and others, and a description of it in English has just

[1] Op. cit., pp. 28–31.

[2] Nachtrag zu meiner Schrift: Die erste Ausrottung eines Polypen in der Kehlkopfshöhle. Tübingen, 1863.

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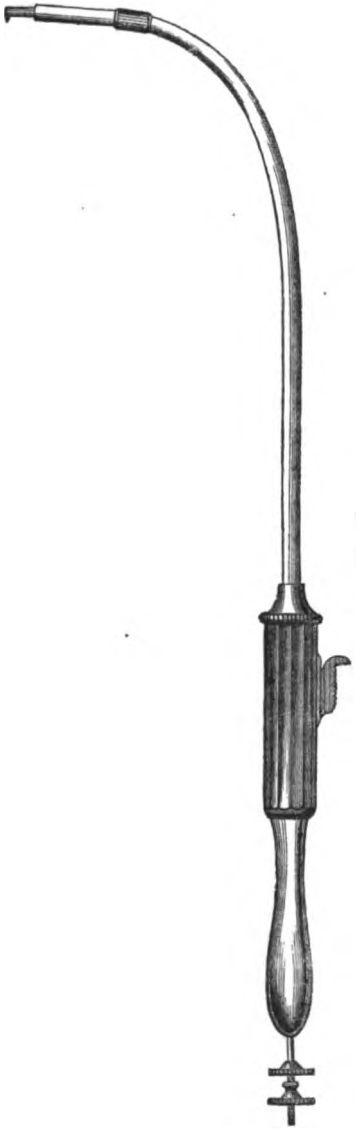

Fig. 4.

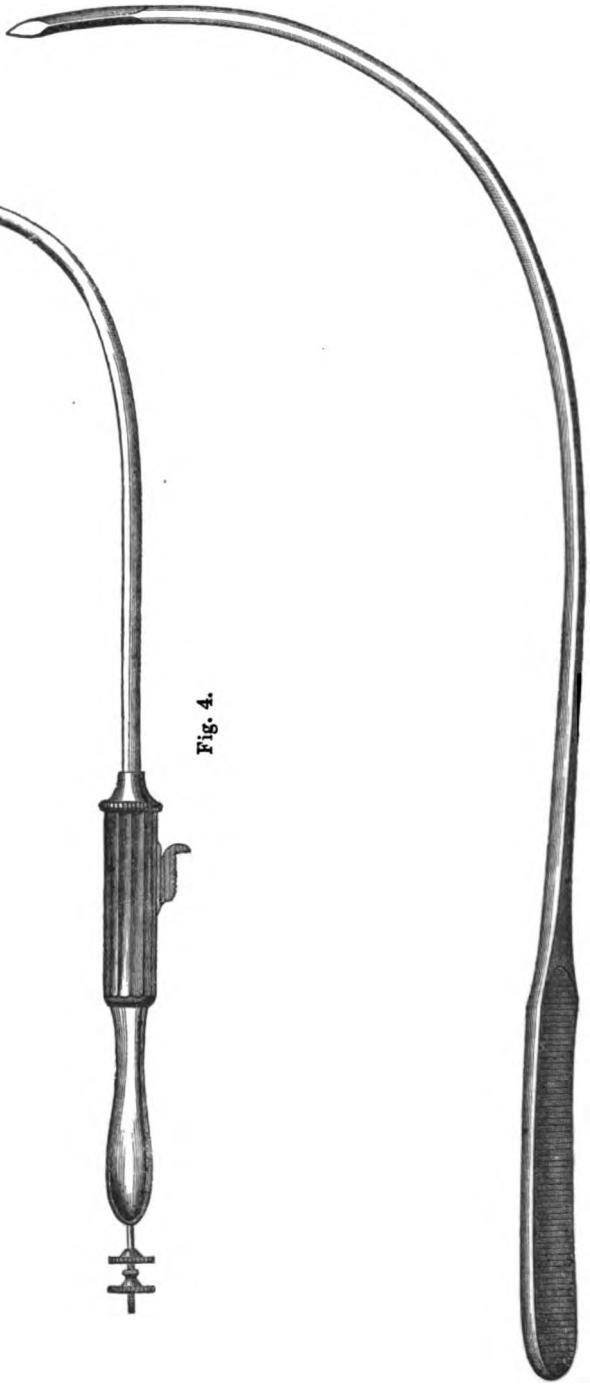

Fig. 3.

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been published.[1] Fig. 4 represents it two-thirds the actual size. The object of discision is of course to interfere with the nutrition of the growth sufficiently to entail its death and separation from the organism. The presumption that scarifications or small incisions into its tissue will produce such an effect has, however, no *general applicability*. I entirely agree with Lewin that it will not occur very frequently that a mucous or fibrous polypus can thus be made completely to disappear as in the fortunate case of Prof. Bruns: "Analogy deduced from polypi in other situations argues against such an hypothesis."

III. CRUSHING.—Another mode of destroying the nutrition of intra-laryngeal morbid growths, and thus to produce their mortification, has been attempted by Moura-Bourouillou. He introduced small metallic bars, properly bent, and rubbed or crushed the tumors between these. The consequence was that pieces of the polypi were thrown off, and the patients experienced some relief. The modified Bruns' forceps, already spoken of and represented in Fig. 5, nearly actual size; Leiter's forceps, represented two-thirds actual size in Fig. 6:[2] and my own polypus forceps, represented in Figs. 7 and 8 (page 687), could, there is no doubt, be used to greater advantage for this pinching or crushing, more especially as they possess the additional advantage that portions of the tumor may occasionally thereby be torn off and extracted, this constituting—

IV. EVULSION.—Tobold and others object to the method of thus pulling off polypi, altogether, but there are extensive growths of soft texture occasionally met with, not easily or not at all removable by caustic, which, from both their position and nature, are well suited for extirpation by this plan, the more if, as has happened to me, excision produces too much hemorrhage, or the tumor cannot be reached by any other means. That no one should think of extirpating by violent evulsion a neoplasm firmly intergrown with a vocal cord, or the like, is almost too obvious to need assertion. Indeed, the greatest possible care should always be observed in these operations. It has happened to me once to have seized hold accidentally of the free edge of a vocal cord just at the moment of the mirror's becoming bespattered with sputum, and the patient jerk-

[1] American Medical Times, June 4, 1864.

[2] Again taken from the translation by Dr. Caswell of Dr. Semeleder's Cases of Extirpation, American Medical Times, June 4, 1864.

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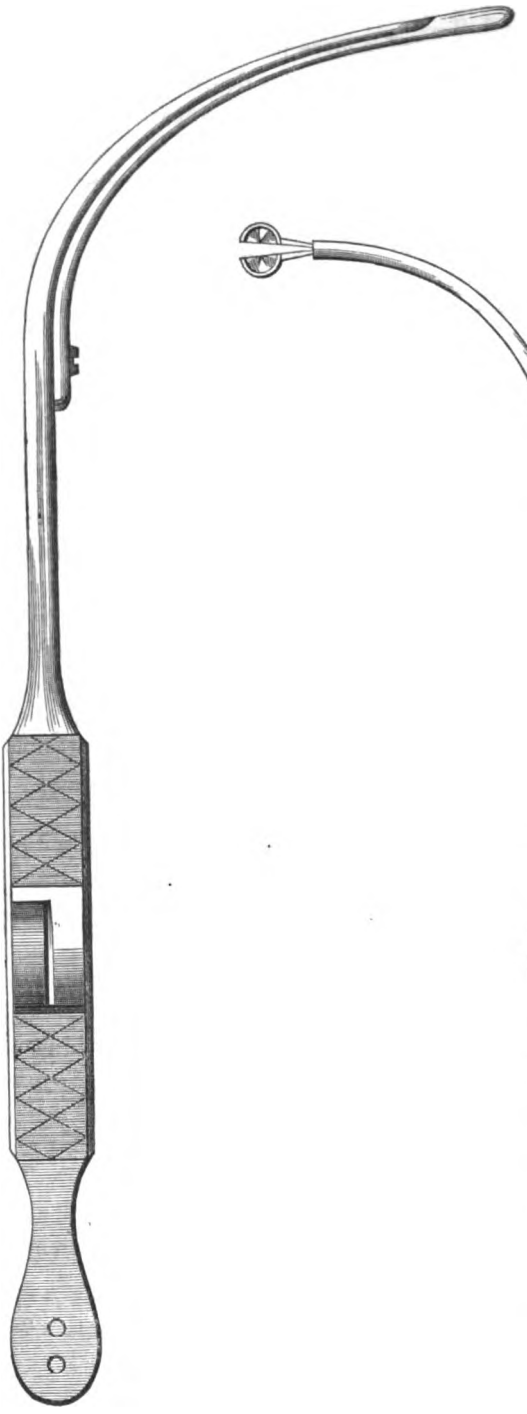

Fig. 5.

Fig. 6.

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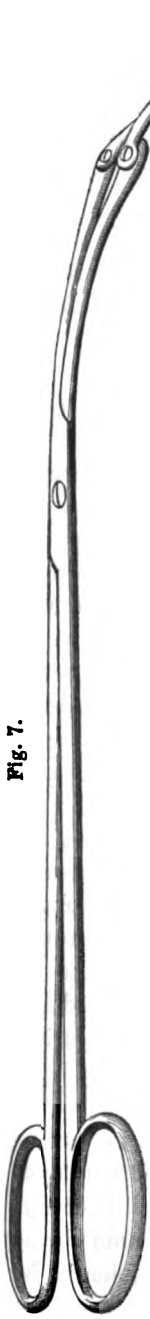

Fig. 7.

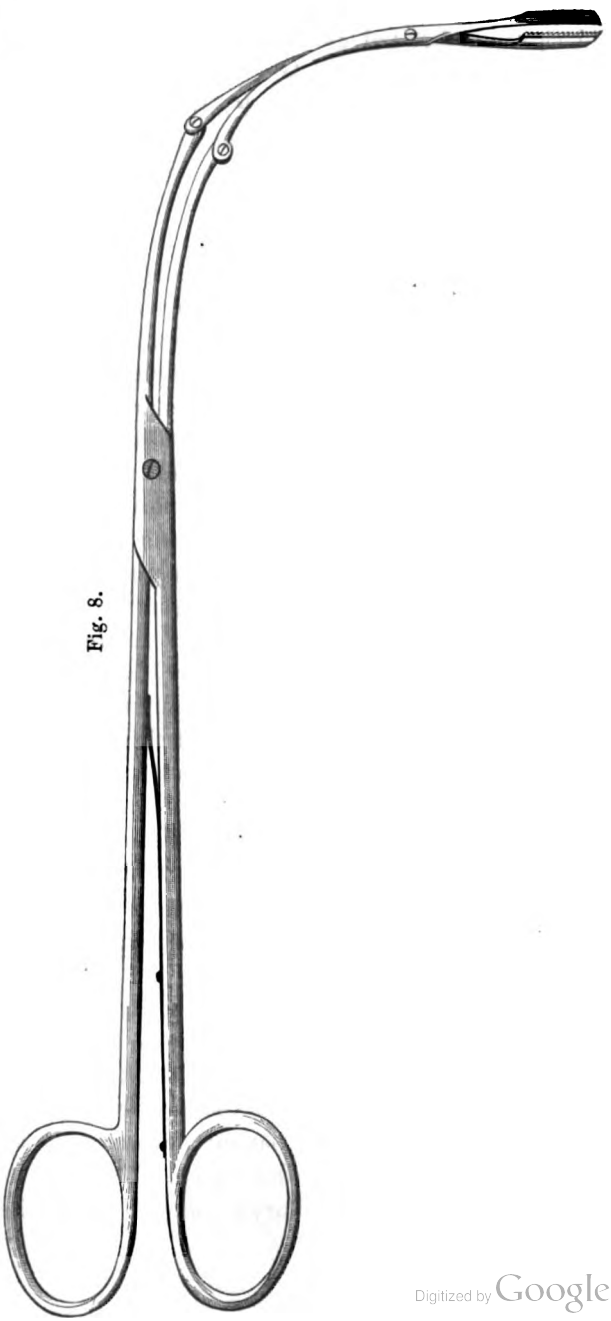

Fig. 8.

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ing his head at the same moment, I must, if I had not fortunately disengaged the instrument instantly, have done immense injury, for I had a perfectly firm (bull-dog) hold. As it was, the pinching was considerable. Fig. 7 represents my polypus forceps (smaller than actual size) opening laterally; and Fig. 8, the instrument opening and shutting forward and backward. It is highly necessary to be provided with both kinds.

In Figs. 1 and 2 I have had a front view and a lateral section made with the laryngeal mirror and my lateral polypus forceps *in situ;* the latter is one with cutting edge, and has just excised a polypus from the left vocal cord.

V. LIGATION.—Under this head I comprise the removal of laryngeal tumors both by the galvano-caustic ligature, and by the ecraseur. For such as project high enough above the superior aperture to be seen and accessible directly from the mouth, this method has been anticipated in ante-laryngoscopal times by the cases of Middeldorpf and Koderik. But how sterile these examples would have remained, and how limited the applicability of what they teach us is, in the light of our present knowledge, is obvious. The heated galvanic wire cannot be used as safely or as frequently as the simple wire of the ecraseur, on account of the injury it might inflict upon the vocal organs. I prefer to employ the laryngeal ecraseur whenever I possibly can, in the removal of tumors. I cannot but regard it as a most happy invention by Gibb, and am even proud of having at once caught up the idea, and having one constructed before I actually saw Gibb's instrument or a description of it. The one figured in the cut (nearly natural size) Fig. 9 represents one made by Windler, of Berlin. The fear of a tumor after being cut off by the wire of the ecraseur falling into the trachea and lower down and doing great damage, well founded as it appears, has never been realized by the occurrence of any injurious accident of the kind as far as I am aware.

VI. EXCISION.—I now come to speak of removal by cutting instruments strictly so-called. The method which Green employed in his first case, viz., "excision with a double hook and bistoury" long before the introduction of the laryngoscope, the tumor being brought into view by the patient throwing it up violently by coughing—as I have related on page 670—Bruns endeavored to imitate in his first case of laryngoscopal extirpation, by carrying

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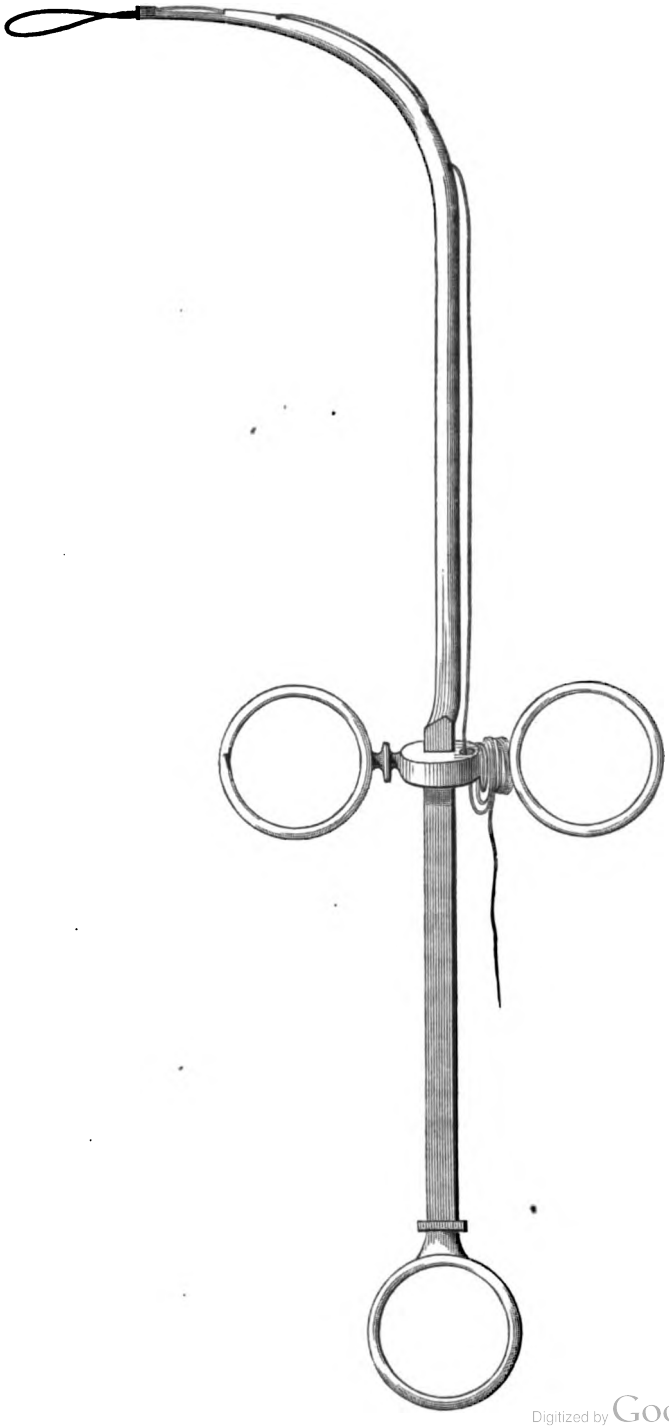

Fig. 9.

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Fig. 10.

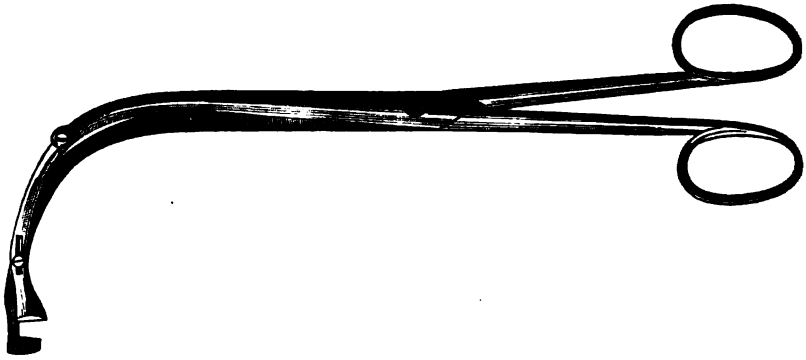


Fig. 11.

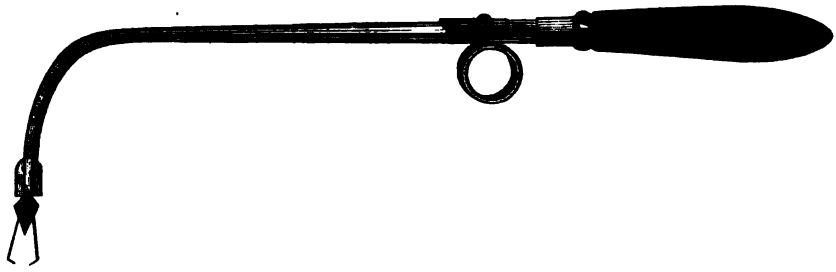
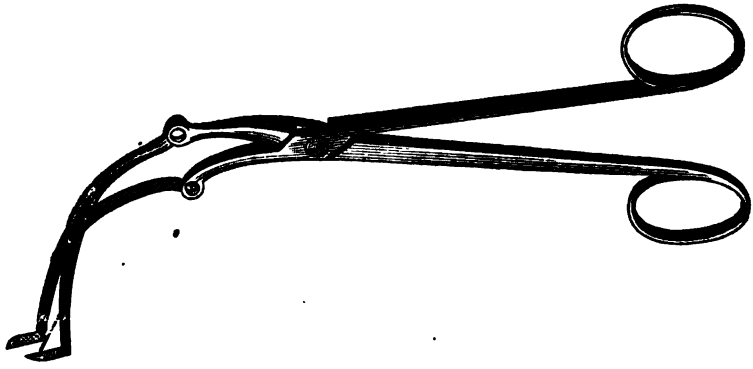


Fig. 12.



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under sight "a covered sharp double hook to below the vocal cord, seizing therewith the polypus at its free end, fixing it, and excising it with a small, double-edged knife, which was also to be carried covered down to the polypus." Bruns had no knowledge, it seems, of Green's case, and after many unsuccessful attempts "although not yet entirely despairing of the feasibility and final success of this method" he chose, very wisely I think, another, and accomplished the extirpation with ease by discision, as I have described on page 683. Besides the simplified double edged knife of Bruns (see Fig. 3), a great number of knives and scissors have been devised for excision of intra-laryngeal growths. I have endeavored to obtain a collection of them, which is of great historical value; but as it would be out of place to mention the whole string of them here, I will enumerate only those I have as yet most used. These embrace, in addition to instruments I have already spoken of (and among them I must in parenthesis again call attention to my polypus forceps, one of which has been made for me with a sharp, cutting extremity by Tieman, and is, therefore, applicable for excision), Tobold's scissors and knives for lateral (or vertical) excision, of each of which the operator uses a different one for cutting on the right and left sides; and my own scissors for horizontal excision, which differs from Tobold's in having the angle at which the cutting-blades join the descending branches towards the epiglottis instead of towards the arytenoid cartilages. Figures 10, 11, and 12, represent these instruments respectively.

I must add that in children with intra-laryngeal morbid growths, Dr. Gibb[1] recommends the introduction of the index finger, and if within reach, the tumor should, he says, if possible be *scraped* away with the finger-nail, a proceeding requiring considerable dexterity.

I have thus rapidly, though I trust explicitly enough, run over the means of extirpating morbid growths within the larynx, available at the present day. On comparing what has been accomplished in the last five years with the previous history, we necessarily appreciate the giant's stride which has carried us from the shadowy past into the light of exact science. In the next section I propose to report the cases that have come under my own observation.

SECTION IV.—REPORT OF CASES.

CASE I. Considered whether as to its comparative size, the difficulties encountered in operating, or its histological and general

[1] Op. citat., p. 141.

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pathological interest, the morbid growth, described in the following case, is, perhaps, the most remarkable ever observed in the living subject:—

Miss M. M., æt. 26 years, had been under various medical treatment, on account of complete aphonia of more than eighteen months' duration, without benefit, when, on the 25th of January last, she consulted Prof. Fordyce Barker, who, on the same day, sent her to me. On introducing the laryngeal mirror I immediately saw a tumor hanging down on the left side, covering the posterior attachment of the vocal cord, and extending as far forward (upward) as the eye could reach. The epiglottis was in a state of unconquerable pendence, and the fauces so irritable that the laryngoscopic examination could not long be endured.

From the history furnished me by the intelligent patient herself, in writing, I condense the following. The child of remarkably healthy parents—there being particularly no throat-trouble of any kind in either branch of the family—brought up in the city in winter, and residing in the country (at Trenton Falls, in a cold, healthy climate) during the summer, Miss M. has always enjoyed excellent health, except that after her 15th year she was quite liable to sore throat, and had on an average two severe attacks every year. Especially for the last six years, she would "catch cold" on the slightest exposure. Inclined to constipation, she gradually also became dyspeptic. She never sang much, but was always confessedly very talkative. Naturally very lively and merry, she was rather heedless as to her health. She was especially in the habit of taking very long walks. In June, 1862, she felt, after every such walk, a dryness and soreness in the region of the larynx. This had occurred on occasions of extra exertion for some time before; but, now, it forced itself on her notice after every exercise, particularly dancing, rapidly going up stairs, etc. Some persons have since told her that at times, previously, already her voice was quite hoarse. Not being given to complain easily, however, she consulted no physician until her health became somewhat impaired by a disease having no reference whatever to the throat. This lasted nearly two months, and on her recovery, towards the end of August, she suddenly—as near as she remembers—entirely lost her voice. She "had not the least other symptom of cold, although everybody wondered what a severe cold she had taken." It required a great effort to whisper at all audibly; great exhaustion followed every such prolonged attempt, as also exercise of any kind. "In swal-

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lowing drinks great care had to be used to prevent coughing, the breath seeming to be shut off altogether. The family physician pronounced it sympathetic hoarseness, which would soon pass away, on regaining strength." She was taking, at this time, tonic medicines, with, it seems, evident benefit to her general health. On the first of November, she returned to the city to winter quarters, and immediately placed herself under a homœopathic practitioner, "selecting him more from a dread of the probang so often used than for any other reason." Her affection, unchanged in every respect, was then pronounced to be chronic laryngitis, and she continued for a long time to take "sweet little granules, pills and powders, without receiving any benefit from them."

When, during the next summer, she was again in the country, friends tried to prevent her exposure to evening air, but as that had never noticeably affected her, she took no especial care of herself in damp weather, deeming it perfectly useless. She did "catch a cold" several times, and though that aggravated some of her throat symptoms while it lasted, it would pass off without any effect on her aphonia, which, it was true, was not so that it could become any worse as the voice was completely extinguished. Since that time she has consulted various physicians, "regular and half-irregular," to regain her voice, but without avail. Among other things croton oil was once prescribed, which, on the first application being used in too great quantity, inflaming her face and eyes, thereby to a great extent, caused the patient very great suffering, and she "refused to try counter-irritation after that."

"Numerous friends of the family had seen instantaneous cures of loss of voice by electricity and cauterization; my relatives were anxious that nothing should be left undone; so, after having once more passed through a course of most nauseous medicines, the field of action was again changed, and probang and caustic were applied to my poor throat every other day for three weeks. * * * * * Finally, as a last resource, electricity was tried for some time; all without avail. In the latter part of December, 1863, I left Dr. G.'s care, being given up as a hopeless case.

"Of a gay disposition, surrounded in a boarding-house by kindred spirits, yet isolated by the loss of audible means of communication; with hope, long deferred, now entirely gone; I lead a most miserable life. My health has rapidly failed under the deprivation my affliction makes me suffer in the forced retirement from society. I have lost appetite, color, flesh, and all spirit to move or act. All

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night long I have a dry irritating cough, which often interrupts sleep, and unless my head is raised quite high, while lying down, a sense of suffocation is experienced, which, on three nights, while having a bad cold, has been so great that I was obliged to sit up in bed for some time to get breath."

Such was her state when she came to me. She complained of no pain, but had a very severe hacking cough. *Ordinarily her breathing seemed entirely unaffected*, but she could not mount the stairs rapidly without gasping for breath. Her whisper was very indistinct, and it evidently required the greatest effort to produce it, even as it was. Her lungs were not found diseased, and though her health could in no respect be termed good, no reasonable connection could be traced between the prominent symptoms and other pathological condition than the presence of the morbid growth. Previously, she had been supposed to suffer from "sympathetic," "nervous" or "hysterical aphonia," "chronic laryngitis," "consumption," etc. etc. Strange to say, no one seems ever to have even suspected the existence of a laryngeal tumor, yet the laryngoscope enabled the diagnosis to be made instantly.

As satisfactory as was the very first attempt at a laryngoscopical examination, as far as the mere existence of the tumor was concerned, obstacles, apparently insurmountable, also presented themselves to the investigation of its attachments or the thorough exploration of the laryngeal cavity. Although Miss M. allowed the momentary application of the mirror, the reflex action induced was extremely violent. "It irritated intensely," "it choked" her, and the gasping and coughing were truly distressing to witness. Besides the epiglottis was pendent, and could by no device be raised to any great extent. I had to withdraw the mirror very quickly, or the storm would come and force me to cease for a time all attempts; the finger even on the tongue produced suffocative attacks (no vomiting, and but little ordinary retching); and the patient, with headache from coughing, eyes suffused and tears streaming over the cheeks, and secretions running from the mouth and nose, all from the irritation of the examination—willing though she said she was to do anything she could to regain her voice—assured me earnestly she "could never stand it." That there was the slightest danger of a fatal termination from the cause producing her aphonia, she had not the most remote idea.

Here was certainly a case in which it seemed absurd ever to expect the oral, pharyngeal, and laryngeal cavities to allow operative

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procedures by means of instruments passed down. It seemed as though they never would become reconciled to the even momentary presence of an instrument, yet this throat had been "probanged" already a number of times. The sensitiveness of all the parts was so great that if the patient had not been previously imbued with confidence in what I should attempt to do, and naturally resolute, she would not have borne the first examination, or certainly would never have returned for a second. Could it ever become possible to extirpate the growth, that was unquestionably there, without gaining access to it from the outside? And was not her voice at all hazards irreparably lost?

At all events, I determined to commence at once a course of "systematic training" of the parts; so, encouraging the patient as much as possible, and securing her co-operation, I endeavored the next day gradually to accustom the organs involved, beginning with the tongue and going inwards, to the touch of the finger, the spatula, the mirror, and other instruments. My patient visited me only every second, third, or fourth day; several times the interval was still longer; yet she was so intelligent and willing that I succeeded, after a few sittings, in demonstrating the tumor to Drs. Barker, Homberger, Ordroneaux, Parigot, Stephen Smith, and a large number of other medical men at various times subsequently.

On several occasions, during these early experiments, the violent cough induced brought away small globular particles of the tumor, varying in size from a pin's head to a very small pea, which, examined under the microscope, showed themselves made up almost entirely of epithelium; and the patient now remembered to have coughed up, in her most violent paroxysms previous to her coming under my observation, similar little masses, which had been allowed to pass unnoticed, however. The hypersensitiveness of the organs involved was slowly but steadily blunted, and in the course of a few months (daily intervals of cessation of practice preventing more rapid progress) the finger could be carried freely along the tongue to its very root; the epiglottis could momentarily be touched on both its glossal and laryngeal face; sounds introduced into the cavity; the tumor touched at various points; the mirror held in the fauces an almost indefinite length of time, etc.

This education had the incidental great advantage that from the beginning it gradually allayed the troublesome symptoms, except the aphonia and the dyspnœa, but even the latter became much more bearable. All symptoms, arising from the irritation, which

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the voluminous tumor produced in the neighboring parts, gradually yielded as these became used to tolerating the touch of foreign bodies without reaction. The cough ceased almost entirely. As there appeared no very great urgency (in spite of the little breathing space this patient really had) I resolved to postpone the attempt really to carry out the object of this preparatory treatment, viz., the removal of the growth *per vias naturales* without the opening of the windpipe from without, until the patient should have attained a sufficient degree of control over the various organs.

Gradually I had been enabled also to ascertain more accurately the superficial extent and attachments of the tumor. I found that it was of an immense bulk, passing to a considerable depth below the vocal cord, and hanging with its lower portions, either free or attached, into the trachea. It was attached in front along a line across the whole of the epiglottis, half an inch below the crest, and laterally it seemed as though it issued from the ventricles of Morgagni, the natural shape of which having been entirely destroyed. The laryngeal cavity was widened laterally, and appeared also to have its antero-posterior diameter increased. Not alone along its peripheral line, but also centrically in every portion, except the most depending, the tumor was attached to parts below. Its consistence was semi-soft. It had the appearance of cauliflower excrescence or irregular strawberry formation. Its large bulk made it certain that repeated operations would be needed for its removal. All kinds of instruments were experimentally passed into the larynx, the tumor was touched, lifted, a little berry broken off (which contained almost nothing but epithelial cells), and, altogether, the case was carefully examined in all its relations.

As the time now rapidly approached when the patient might be called ready for the extirpation, I consulted one of our most eminent portrait painters, with the view of having a perfectly objective faithful picture of the growth *in situ*, true to nature as reflected by the laryngoscope, as to form, color, etc., and which should be made entirely independent of my own impressions. This artist, with another one—a friend—had frequent opportunities to see the patient's larynx with both artificial and sunlight: and after very numerous sittings, the portrait, marked Fig. 13, was presented to me as the result of the combined labors of the two artists. Its faithfulness was verified by oft-repeated comparison; and, if it was not for its immobility, it would perfectly and absolutely give to the beholder the image, as to form, which the living larynx of this young lady presented

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to the examiner with the laryngoscope. As to coloration, it is impossible to imitate nature in such a painting as this; but I believe that the proper tints have been selected as far as artificial water colors yield them. At all events when seen with soft, indirect light, it must surprisingly recall the impressions of the colors, which those may have who have seen the prototype with sunlight directed into the cavity. It will be noticed that the only portion of vocal cord visible—the posterior part of the right side—has a washed bluish tint. A gentleman who saw the picture only, remarked "that this must either be an error of the artist, as that would indicate necrosis, or that it might be produced by pressure of the tumor upon the vocal cord. However the latter may be, it is certain that as it is represented in the figure so the rays of the sun revealed it; whatever reflection from the yellowish growth and the walls of the cavity may have to do with the appearance, I do not presume to decide; but that it was seen as here shown there is no doubt.

The great triumph achieved by the "preparatory education" was surprising to many who watched the case, and to the patient herself. Greater difficulties hardly ever present themselves to the continuance of the mirror in the fauces longer than a moment, nor have they ever been more completely overcome. With the exception of the epiglottis, which was still sometimes rebellious, all the structures this side of the growth were "perfectly well educated and well behaved." The epiglottis allowed itself to be raised with the finger or any instrument, and laid in the closest contact with the base of the tongue, and would then remain entirely erect for some time usually; or, if the patient or I would place a finger in either angle of the anterior laryngeal wall, or even on the tongue laterally in front of the epiglottis, it would assume a proper position; otherwise, it would occasionally still interfere with the proper entrance of instruments, though, at times, it would act perfectly well of its own accord. But the patient could protrude her tongue very far, excurvate it posteriorly, and hold it immovably at the very floor of the mouth, without any support or artificial aid whatever. She acquired the same control over her head, in fact, all the muscles about the head, face, and neck. I never needed any assistant, nor any accessory apparatus of any kind. She even held the laryngeal mirror in position for me several times, and held it well.

After vain attempts to get the loop of the ecraseur around the projecting free portion of the tumor, I commenced the extirpation

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in good earnest, on the 12th of May, by introducing my scissors, and cutting from before backwards to its fullest extent. The incision commenced at a point seen in the figure, about the middle of the tumor on the right hand side of the reader, and extended about five-sixteenths of an inch backward (downward) in the figure. I disengaged the instrument without extracting any portion of the tumor. The bleeding was profuse, indeed, it became alarming, so that I determined not to use the scissors again if I could possibly get along without them. After cauterizing severely with nitrate of silver, applying cold, etc., the bleeding ceased gradually. The incision had given the patient no pain at all, but now the throat became very sore. The next day we rested, but on the following, after removing with my polypus forceps a great number of the small superficial berries, I extracted the large portion cut the first day. This I did with my cutting forceps, in spite of my resolution not to cut any more, and as the hemorrhage was again more than I wished comfortably to witness, I used neither the scissors nor cutting forceps again. The large portion removed was preserved after taking off a thin section for microscopical examination, but shrank greatly. The mass was extremely juicy and vascular, although the superficial portions showed no trace of loops of vessels at all. After the lapse of three or four hours, when the bleeding had subsided, the patient wished me to go on removing portions of the tumor, which I did with my forceps, and afterwards with the modified spring forceps of Bruns, which Dr. Simrock kindly lent me.

Not to tire the reader with too great prolixity of detail, I will cut the story short by saying that for the next two weeks I "evulsed" portions of the tumor nearly every day, preferably with Dr. Simrock's Bruns' forceps, as his was smaller than mine, and had a better grasp. The only objection was, after a little while, that I could not reach low enough down with it, as it is not long enough in its descending branches. Holding the forceps open just above the part I wanted to seize, I sometimes made the patient cough—the piece I wanted thus jumping into the claws of the instrument. This method of evulsion, carefully performed, in spite of all that others may urge against it, was the most efficient plan in this case. Caustics had been tried and given up as perfectly useless.

For a week, the more I removed the more I found I had not come to the bottom yet. I suppose I have now altogether removed as much in bulk as a small ordinary egg. Evulsion gave the

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patient almost no pain at all, and caused but trifling hemorrhage. There now remains only some of the mass attached to the roof of the lower laryngeal cavity on the left side, and small remnants here and there in various portions of the upper cavity. How far the vocal cords have degenerated it is as yet impossible to say. I have carefully plucked out as much of the mass as I could, and now cauterize the remnant under sight with acid nitrate of mercury —chromic acid having made the patient's throat too sore.

The patient's respiration may be deemed unimpeded now; her whisper is more distinct, more audible, and gives her less trouble, as it costs less effort. Whether she will ever recover her voice entirely is of course impossible as yet to say. Every other way the case has so far been a perfect success.

Portions of the tumor removed have been examined microscopically by a number of gentlemen, all agreeing that it is an exceedingly interesting tumor; and with some remarks on this subject I shall conclude the report of the case, which, had I minutely related all its points of interest, would have filled many more sheets of paper than it now has pages.

On examining a vertical section of the tumor, in water, with a magnifying power of some two hundred diameters, we find the entire mass to be of a more or less markedly fibrous look, with here and there something like cell structure, but nothing very distinctly marked. Adding a drop or two of acetic acid to the preparation, we find at once the appearance seen in Fig. 14. At *a*, *a*, etc., is an irregularly-shaped papillary mass formed of areolar, fibrous, or connective tissue (the formed material of Beale, and the inter-cellular substance of Virchow, Donders, etc.), having interspersed throughout its substance numerous fusiform bodies of different refractive power and chemical reactions than the basis-substance. These are the so-called connective-tissual corpuscles of Virchow, which, in a transverse section, have a more or less stellate form, and *seem*, by their projections, to anastomose with one another. (From this appearance, and the circumstance that, as Frey and others have shown, they are often injected when the capillaries, *x*, *x*, etc., are filled with carmine or Prussian blue, as well as from the "silver-impregnation experiments" of von Recklinghausen, Virchow assumes that they form an anastomosing network to convey nutrient materials to the part, and thus to replace the serous capillaries which do not exist. Lyonel Beale, however, denies the existence of such a network during life; and if any

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intercommunication is observed after death, it is simply the result of cadaveric alteration, according to him. Beale says, Connective tissual corpuscles are solid masses of *vitally active* or *germinal* matter,[1] as contradistinguished from the intercellular substance or matrix, which he contends is *inert* or *formed* material.)[2]

At *b*, *b*, etc., we find the corpuscles are no longer scattered about, but are grouped more or less closely together; and their shape, from fusiform, is now changing to oval; they are much more distinctly granular, and the matrix is also finely granular, with but very indistinct striæ, if any at all; in fact, we have here a structure which has been indifferently styled "basement membrane" or "blastema." (The term "basement membrane" is a faulty one, because there is here no membrane at all, nor is the mass structureless, as *that* should be; the term "blastema" might be admissible, if it were merely used to signify that the connective tissue differs here from that in the centre of the papilla in structure, and physical and vital properties, but not if it were understood to mean that we have here an exudation capable of organization.) Proceeding outward, the corpuscles are seen to be still more granular, and now become elongated and with their axes more or less parallel to one another and close together. Pursuing the course outward, we next observe that the corpuscles become fusiform cells (Figs. 14 and 15), resembling, in a very striking manner, the so-called fibro-plastic cells of Lebert and others. These cells grow still larger and larger, the further outward we examine them, and, presently, they change their shape also somewhat, until, instead of fusiform, they are more or less globular; the nucleus undergoing

[1] "*I. e.*, matter which is capable of further production and development, capable—in other words—of displaying the peculiar phenomena which, for want of a better name, we have agreed to call for the present 'vital.' By using this epithet we do not mean to imply, however, that they may not in reality be regulated by purely physical and chemical laws; but wish simply to state that the manner in which these laws here act, or the conditions modifying their results, are, so far, unknown."

[2] By *formed material* is here of course meant, in contradistinction to the *germinal*, matter *incapable* of vital changes, but capable of physical and chemical ones.

The little digression above enclosed in parentheses, as well as the remarks on the terms "basement membrane" and "blastema" will probably add to the interest of the interpretation of the microscopic appearance. In the present state of knowledge on the subject of the disagreement between two of the most advanced histologists of our time, it would be imprudent to offer any decided opinion; but as it certainly seems more safe to withhold assent for the present to the hypothesis of the existence of the network in question, I do not follow Virchow, and adopt, instead, the language of Beale.

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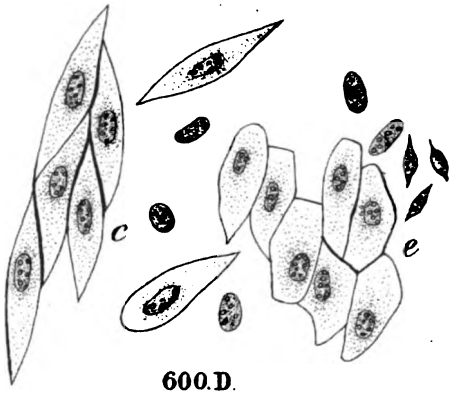
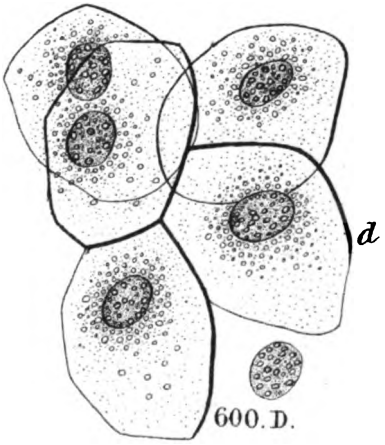
Fig 15.



600. D.

Fig 16



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the same change; this goes on until finally we have a mass of cells bearing the most striking resemblance to epithelium; in fact the resemblance is in every respect so marked that, on isolating them—as seen in Fig. 16—it certainly is impossible to distinguish them from epithelium taken from any part.

As the drawing presented in Fig. 14 is not a *schematical* representation, nor a sketch drawn from memory aided and amended by fancy, but an actual accurate portrait of what the microscope revealed, carefully prepared and perfectly objective in every respect; it is obvious that the tumor is exceedingly interesting in a pathogenetic point of view, as showing what Virchow was the first to observe and prove, that sometimes, though it is not, I think, the general rule, *epithelium is developed from progressive metamorphosis of connective tissue.*

Its starting point being in the connective tissue, the tumor unquestionably has a right to the title connective-tissual tumor, or "fibroma," but every pathologist examining its superficial portions only would as unquestionably call it a true and typical "epithelioma;" and as to seriousness of prognosis it approximates the latter, or at all events a "sarcoma."

Case II.—E. F., æt. 31, had been hoarse for a long time, perhaps two or three years, when one night, after returning home from a fire, he being a fireman at the time, he found he could not make himself heard at three feet distance; and his voice has never returned, in spite of the most assiduous "doctoring" for the last five years. Otherwise his health is very good, although his whole life almost has been, he says, "a succession of colds." Has never had syphilitic disease. His breathing is slightly audible, and his voice a low rough whisper. The whole pharyngeal and laryngeal mucous membrane was found in a state of chronic catarrhal inflammation, and an irregular leaf-shaped soft polypus was found sprouting from the right half of the posterior wall of the larynx and covering nearly half of the vocal cord on that side. Fig. 17 shows how his larynx looked after two or three weeks of preparatory treatment. The polypus was entirely destroyed by alternating cauterizations with chromic acid and nitrate of silver; the chronic catarrh yielded only partially. His voice kept a hoarse harsh sound, but became sufficiently loud. The radical treatment, *i. e.*, the destruction of the tumor, lasted from April 19, 1862, to nearly the end of December

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of the same year. From a letter recently received from him, I fear the return of a morbid growth.

CASE III.—One of the most satisfactory cases possible was the following. The subject is a boy who came to me on one of the coldest mornings last winter, very early in the morning immediately after having had a horrible suffocative paroxysm. The examination, which he bore perfectly, revealed the picture presented to the reader in Fig. 18, careful inspection of which makes all description unnecessary. The bluish tint, especially of the lower polypus, and the bilobate form of the upper, are very faithfully rendered. The patient's age was fourteen years; for over eighteen months he had been subject to the most terrible "choking spells," coming on sometimes at night (on turning or lying on his right side doubtless); and sometimes in the daytime during the most perfect enjoyment of health, suddenly on turning, or stooping down, or the like, he would "get a fit." His suffocative paroxysms were somewhat like epileptic seizures, it seemed, at least so all his friends, and even his doctor, had called them. When he first spoke of his spells, I did not know to what he referred, as he said he had the fits. He suffered also from varying hoarseness, dysphonia, and aphonia. Everybody that knew him thought his case a very strange and extraordinary one; one moment's look at the condition of his vocal organs explained everything.

After I had examined him, I told him to come back in two hours. In the mean time I procured an artist who took the portrait Fig. 18, while immediately after—the patient having inhaled a very little chloroform—I succeeded by good luck in throwing the loop of the ecraseur around both polypi at the same time, and both were drawn out with the loop. There was not a drop of blood lost that I could see; the boy's voice was immediately entirely restored, and he has never had a return of the paroxysms since.

Examined under the microscope, the growths showed epithelial cells and fibres of connective tissue. The two had two separate extremely slender stalks, and I wondered greatly that these thin threads could so long support the polypi with all their mobility.

CASE IV.—Mrs. S., a widow lady, still rather young and very talkative, was sent to me for examination on account of a very anomalous cough that had resisted all medication. Besides various drugs, probanging had been in vain resorted to for several months. She

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Fig 13

Fig. 17.

Fig 18

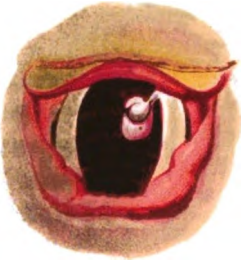

Fig 19.

Fig 20.

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Fig 21.

Fig 22.

Fig 23

Fig 24.

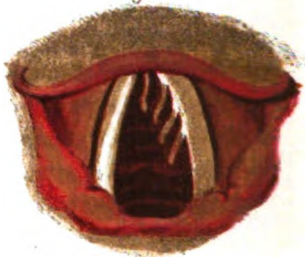

Fig 25

Fig 26.

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coughed at irregular intervals with a peculiar "dead sound," her speaking voice had changed in character, and her previously good singing voice had been entirely interfered with for three or four years. It was not until after nearly three weeks had passed, most uncomfortably to me, that I succeeded in making the diagnosis; its result is before the reader in Fig. 19, which explains all the troublesome symptoms. Usually when the vocal cords were apart, nothing was seen of the polypus except its pedicle, which merely looked like a raised line right across the right cord seemingly proceeding from the ventricle. On closing the rima the tumor very curiously stayed below much oftener than it was thrown up even by expiratory movements, unless they were forced. I thought I was sure several times that there was something below, corresponding to the line across the cord, which prevented the phonatory approximation of the vocal cords from taking place perfectly; but it was not until after some time that I succeeded in recognizing it accurately. It was then in the position drawn.

After considerable practice upon it I finally twisted the polypus off with a forceps, but lost it in withdrawing the instrument. The patient spit it up without any difficulty. Violent inflammation of the whole interior of the larynx followed, which after nearly three weeks' treatment left the voice worse than I found it. The polypus was gone and the cough much relieved. The patient left off treatment against my advice.

CASE V.—P. H., æt. 28 years, was formerly a "drummer" for a large drygoods or clothing establishment, and in possession of a good voice. Some three or four years ago, he commenced to become hoarse, which hoarseness increased gradually until he is now almost aphonic. Occasionally he emits with much exertion what he calls an explosive sound, *i. e.*, an audible, though a hoarse and dulled one. Usually his conversation amounts only to half loud and hollow whispers. I examined him for the first time, May 15th, 1863, when with the above symptoms he presented the laryngoscopic image faithfully copied in Fig. 20. Both tumors were touched daily with nitrate of silver in substance for three weeks without apparently the least impression, except discoloring the surface; at first the powdered crystal, taken up by a moistened bit of sponge, was deposited in rather large quantity on the surface and around the tumors, by means of the laryngeal sponge-carrier, afterwards the solid stick was used with the porte-caustic, brought

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in contact with the tumors and held there as long as possible, which sometimes was but an instant, sometimes a little longer.

After three weeks, chromic acid was tried, and under its influence they rapidly showed signs of mortification, and melted. Under the further local employment of acid nitrate of mercury once, and argento-nitrate of mercury some ten or twelve times, the patient recovered a sufficiently loud and clear voice, although traces of the fibrous tumor were still visible in the form of a shrunken stump.

CASE VI.—In July, 1861, Mr. J. O'D., a middle aged coal merchant then residing in Philadelphia, consulted me on account of some hoarseness which he minded less, however, than a very annoying "catch in the breathing" which seemed connected with it, and which caused him quite frequently to cough also. Making but a very short visit, I did not arrive at any satisfactory result as to his condition. But a year and a half later, the same symptoms having continued and even increased, their cause was discovered to be the presence on the left vocal cord of four very small polypi and of a little larger one, springing apparently from the posterior attachment of the vocal cord. At this time, he also told me that the slightest thing took his voice away, and that he had a constant desire to cough, as though there were some bread crumbs, phlegm, or something in his throat. Various applications were made to the tumors. The posterior one was removed mechanically, whereupon the others yielded to the local applications; the catch disappeared and the voice permanently improved. Fig. 21 shows the position and size of the polypi. The posterior one grew considerably while under my observation, which fact determined my operation.

CASE VII.—The same words as those of the patient last described, were used by F. T., a tinsmith, æt. nearly 30 years, to complain of a peculiar difficulty experienced in breathing: *i. e.*, he also had "a catch in the breath." I found in his case the appearance in the posterior portion of the larynx represented in Fig. 22. This patient has had syphilis, although I do not know that the morbid growth observed is therefore specific; he breathes habitually during the day a very irritating atmosphere, *i. e.*, one containing metallic particles and dust in abundance. His voice is always more or less hoarse, but he has never entirely lost it. Giving the patient the benefit of the doubt, I prescribed internally antisyphilitic alteratives. Local appli-

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cations were made once of nitric acid very carefully—which nevertheless produced considerable pain and inflammation—thereafter of argento-nitrate of mercury, followed up with tannic acid and other astringents. The tumor shrank and the "catch" disappeared. He was under occasional treatment for over a year; yet some thickening at the inter-arytenoid fold remains to this day.

CASE VIII.—The subject of the following case was hoarse from childhood, and has always been supposed to have consumption. He is a man of over forty years, not very strongly built, but in whom the most careful examination could detect no pulmonary disease. He would not have come to me if he had not after an unavoidable exposure "caught cold, the worst kind;" he had coughed very badly for over three weeks. Aside from the acute symptoms (which concern us less), I found on making the laryngoscopic examination, which, by the way, was more easily made than in almost any case I have met, to my great surprise, that a tumor, as drawn in Fig. 23, was attached apparently just in the middle line below the cushion of the epiglottis. Without going into the details of treatment instituted, suffice it to say as far as the tumor, is concerned, that it was with the greatest difficulty and only after a great deal of reasoning and persuasion I could obtain his consent to my trials for its extirpation. After unsuccessful attempts spreading over nearly six months, with every instrument I could think of, I regularly came back from time to time to the ecraseur. I had several different patterns of the latter instrument made to adapt it to this case, seemingly without avail. With the patient's impatience and my own failures, I was on the point of giving up my attempts several times; the seeming ease, yet real difficulty, of seizing the tumor, proceeded from the fact that during simple examination the view his larynx presented was as shown in the figure, but (and there was no hypersensitiveness of the parts involved) the moment any instrument was introduced, everything changed. I do not wish to protract this account, and it would require some space to describe the various points satisfactorily. The tumor would assume a position close to the anterior wall, that is, it would be buried in the receding angle of the thyroid cartilage. I could never ascertain whether the pedicle was attached between the anterior vocal processes or a little above or a little below them; it seemed to be exactly in the mesian line, and I have the impression that the attachment was below that of the vocal cords, though of course but

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little below. The cushion of the epiglottis, either naturally largely developed in this man or pathologically swollen, seemed to be the greatest obstacle in the way of catching hold of the tumor with the loop; but the reaction induced whenever I tried to pass the instrument down low enough, was alone sufficient to prevent *the possibility* of success. All kinds of manœuvres were tried in vain; but one day with the wire loop bent almost parallel with the handle of the ecraseur, I fished up the polypus, without exactly knowing myself how. The instantaneous reaction was terrific, but in the excitement of the moment I had fortunately presence of mind enough to draw the wire home. The tumor left the larynx with the instrument, and though I dropped it in the fauces, I got it back afterwards. It was not examined microscopically, however. As soon as the immediate effects of the operation had passed off, the patient expressed his joy at the change produced in him, most gratefully and in extravagant terms. He felt like a different man; it now was a luxury to breathe, as it never had been to him before in his life; he felt as though a large weight had been taken off him; his voice became fuller, clearer, and more free. Both of us were well repaid for our perseverance.

Case IX.—Mrs. M. C., æt. 35, has always enjoyed good health until September, 1860, when, on nursing a neighbor's child, now suspected of having been syphilitic, she was bit in the nipple. The nipple bled considerably, and it and the whole breast were very sore for several weeks. She has been ailing almost all the time ever since. For two years she has been aphonic; and though she is under the impression that she may have been a little hoarse long before the accident in 1860, thinks that her dysphonia as well as all her other troubles took a start from that. She has no cough nor pain, but complains of a very uncomfortable feeling of exhaustion and heaviness, which follows every effort to use her voice longer than a few minutes. Her voice is at present reduced to a low, thrilling whisper, still more indistinct than inaudible. She has had dyspnœa for some time—cannot tell exactly how long ago—but that has entirely passed off; at present, she has no difficulty of breathing on any exertion or at any time; she can f. i. run up and down stairs as well as ever she could (only that it hurts her somewhere, which has nothing to do, however, with her respiratory organs). On direct inspection the throat looked rather healthy; however, the tonsils were shrunken, and the follicles on the posterior

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wall of the pharynx raised into two slight pillars laterally, but it was quite smooth in the middle; uvula was normal. The laryngoscope revealed what is seen in Fig. 24. The vocal cords look as though they were washed over. The most anterior projection seemed rather to be attached to the right vocal cord, although that could not be determined with certainty; the other three are seen to proceed from the left. After numerous introductions of Tobold's polypus scissors, I succeeded in cutting off all four of the streamers, leaving only small stumps. Her voice became much more distinct. The pieces cut off, which the scissors did not in a single instance retain, were coughed up without injury. The stumps are cauterized, and local treatment of various kinds applied also to the vocal cords; but her voice retains to the present day a peculiar harshness and hoarseness.

CASE X.—Fig. 25 reproduces the laryngoscopic appearance of the larynx of a young lady who had lost her voice completely, after exposure to cold and wet several times, but had regained it usually in a few days. On March 5, 1864, when she consulted me, and when the sketch was made, she could speak in a half audible whisper only. Having previously been a tolerably good and passionate singer, she has had acantophonia, and been subject to attacks of aphonia, for fully six years. Otherwise, her health was perfect.

The tumor seen on the right side (*i. e.*, on left vocal cord) was removed by means of my cutting forceps; and Figs. 1 and 2 (see pp. 681, 682) are intended to illustrate the operation.

Microscopically examined, the tumor showed delicate fibres, without nuclei in a structureless mass, with very numerous epithelial cells, many of them free.

By this time, the lady has recovered both her speaking and singing voice perfectly, and I believe permanently.

CASE XI.—Mrs. B., æt. 30 years, remembers to have been subject to easily becoming hoarse as a child while taking singing lessons; but her voice, naturally good, was properly cultivated, and she became a rather fine singer with an extensive soprano register. She came to America, sixteen years ago, and, while crossing the ocean, became very hoarse. As she was very sea-sick, she ascribed her hoarseness to the straining of the throat occasioned thereby. But her hoarseness has never left her, at least it has degenerated into complete acantophonia. "Everything under the

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sun," from regular medical treatment to the most obvious quackery, has been tried to cure her of this; but the cause was never thought of until my examination revealed it. Fig. 26 shows it. She feels constriction, and on "catching cold" the sensation of a foreign body in the region of the larynx, and hawks up phlegm to clear her throat.

This case has not yet been subjected to treatment.

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PRIZE ESSAY.

THE

CRIMINALITY AND PHYSICAL EVILS

OF

FORCED ABORTIONS.

BEING THE

PRIZE ESSAY TO WHICH THE AMERICAN MEDICAL ASSOCIATION AWARDED THE GOLD MEDAL FOR MDCCCLXV.

BY

HORATIO ROBINSON STORER, M. D., OF BOSTON,

ASSISTANT IN OBSTETRICS AND MEDICAL JURISPRUDENCE IN HARVARD UNIVERSITY, SURGEON TO THE NEW ENGLAND HOSPITAL FOR WOMEN, AND PROFESSOR OF OBSTETRICS AND THE DISEASES OF WOMEN IN BERKSHIRE MEDICAL COLLEGE.

WRITTEN, PUBLISHED, AND ISSUED FOR GENERAL CIRCULATION, BY ORDER OF THE AMERICAN MEDICAL ASSOCIATION.

Casta placent superis. Castâ cum mente venito,
Et manibus puris sumito fontis aquam.

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TABLE OF CONTENTS.

PREFATORY REMARKS 711

I. Origin and purpose of the present essay 713

II. What has been done by physicians to foster and what to prevent the evil 715

III. What is the true nature of an intentional abortion when not requisite to save the life of the mother 720

IV. The inherent dangers of abortion to a woman's health and to her life . 724

V. The frequency of forced abortions, even among the married . . 735

VI. The excuses and pretexts that are given for the act . . . 738

VII. Alternatives, public and private, and measures of relief . . 740

VIII. Recapitulation 742

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PRIZE ESSAY.

THE CRIMINALITY AND PHYSICAL EVILS OF FORCED ABORTIONS.

PREFATORY REMARKS.

It will be noticed that in the following essay, the recipient of the special prize for 1864–5 of the American Medical Association, its author makes frequent reference, as to those of another, to his own previous labors. This circumstance, now that his identity has been revealed, might at first seem an infringement of the rules of good taste. In the facts, however, that he felt compelled to take unusual pains to conceal that identity prior to the decision of the Committee, with all of whose members he has long enjoyed intimate acquaintance, and that little other published material as yet exists, from which to draw upon this subject, save his own, he places his excuse, and throws himself upon the generous sympathy and forbearance of his readers. [The remainder of the prefatory remarks stand just as they were presented to the Committee.]

The writer, who knew nothing of the project to elicit a direct and effective appeal to women upon the subject of criminal abortion, until after it had been decided at the New York meeting,[1] has long been a member of the Association. He is aware, from personal observation, that induced miscarriage is of very frequent occurrence, and that its effects are to the last degree disastrous to the

[1] "The preamble, and resolution were signed by Philo Tillson, President, and S. L. Andrews, Secretary, of the Northeastern District Medical Association of Michigan, as having been adopted by that Association, at its annual meeting, held on the 19th day of May, 1864, and which its delegate, Dr. Stockwell, was instructed to present to the Association."—*Trans. Am. Med. Association*, 1864, p. 60.

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country at large. He has seen the change that has been effected in professional feeling upon the subject as to the need that this depopulation, or rather prevention of repopulation of the country, should be arrested, since the publication of the report of the Association's Special Committee, which was appointed at Nashville in 1857.

It is, perhaps, presumptuous for him to undertake a task so strongly appealing to all one's eloquence, sympathy, and zeal, and for the proper performance of which there exist so many gentlemen in the profession better qualified than himself. He does it, however, as the passing traveller in distant lands, by casting his pebble upon the pile of similar contributions that mark a single wayside grave helps to raise a monument to warn of danger and to tell of crime, in the hope that this waif of his may, perchance, effect somewhat toward arousing the nation to the countless fœtal deaths intentionally produced each day in its midst, and to prevent them.

The Association has empowered the Prize Committee to award the premium of the present year to the best popular tract upon the subject of induced abortion. The writer presents the accompanying paper neither for fame nor for reward. It has been prepared solely for the good of the community. If it be considered by the Committee worthy its end, they will please adjudge it no fee, nor measure it by any pecuniary recompense. Were the finances of the Association such as to warrant it in more than the most absolutely necessary expenditures, yet would the approbation of the Committee, and of the profession at large, be more grateful to the writer than any tangible and therefore trivial reward.

It is a singular and appropriate coincidence that the action of the Association, originating as it did from Boston, in 1857, and recognizing in no uncertain language, alike by the resolutions that were formally adopted by the Louisville Convention, and by the memorial presented by its President to the different legislative assemblies and State Medical Societies of the Union, the necessity of a radical change as to the popular estimate of the crime, should now culminate and become effective at a meeting of the Association in Boston, by an authorized appeal in behalf of the profession to the community, which alone makes and enforces the laws, till now a dead letter as regards abortion, and which alone commits, palliates, and suffers from the crime. It is an equally striking and appropriate coincidence that the Chairman of the Committee, at whose hands the selection of that appeal must be made, though the Committee

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had been chosen for a general purpose before it had been decided by the Association to elicit essays upon this special subject, should be the physician who, in New England, first appreciated the frequency of criminal abortions, pointed out their true character, and denounced them.

If this essay prove successful, its author only asks that the seal which covers his identity may not be broken until the announcement is made upon the platform of the convention, pledging himself that this is but for a whim of his own, and that he is well, and he trusts favorably, known by many of the best men of the Association throughout the Union.[1]

I.—ORIGIN AND PURPOSE OF THE PRESENT ESSAY.

At the meeting of the American Medical Association, held at New York, in 1864, it was, after mature deliberation, decided to issue "a short and comprehensive tract, for circulation among females, for the purpose of enlightening them upon the criminality and physical evils of forced abortions."

The source of this essay is, therefore, in itself, well worthy of attention. The Association referred to represents the medical profession of America, for it is composed of delegates, and only of delegates, from every regularly organized hospital, medical society, and medical college throughout the land, its members being, therefore, almost all of them gentlemen advanced in years, of extended experience, and of acknowledged reputation. That they should unanimously have concurred in recommending any measure is, so far, proof that it was needed.

There are those, perhaps, who may suppose that in advising that pregnancies, once begun, should be allowed to go on to their full period, physicians are actuated by a selfish motive. On the contrary, it will be shown that miscarriages are often a thousand-fold more dangerous in their immediate consequences, and, therefore, more decidedly requiring medical treatment than the average of natural labors; that they are not only frequently much more hazardous to life at the time, but to subsequent health, their results in some instances remaining latent for many years, at times not showing

[1] Now that the decision of the Prize Committee has been made, the purpose of the above stipulation becomes evident. The committee consisted of Drs. D. Humphreys Storer, Henry I. Bowditch, J. Mason Warren, and John H. Dix, of Boston; the chairman of the committee being the writer's father.

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themselves until the so-called turn of life, and then giving rise to uncontrollable and fatal hemorrhage, or to the development of cancer, or other incurable disease. It is in reality the physician's province, indeed, it is his sacred duty, to prevent disease as well as to cure it, and this, even though it must plainly lessen the business and the emoluments that would otherwise fall into his hands. Would women listen to the appeal now to be made to them, an immense deal of ill-health would be prevented, and thousands of maternal as well as fœtal lives would annually be saved.

And, moreover, in the fact that the profession thus transcends, almost for the first time, upon any topic in this country, the barrier which for mutual protection, both of science and the community, has always been allowed to stand, and directly addresses itself to the judgment and to the hearts of women upon a topic vital to themselves and to the nation, there is afforded most conclusive evidence that the subject is of the highest importance, that the step now taken is a necessary one, and the motives that prompt it sincere.

To women, on the other hand, how interesting the topic! It is one that affects, and more directly, perhaps, than can anything else, their health, their lives. It concerns their discretion, their conscience, their moral character, their peace of mind, even its very possession, for cases of insanity in women from the physical shock of an induced abortion, or from subsequent remorse, are not uncommon. It involves often all the elements of domestic happiness, the extent or existence of the home circle, the matron's own self-respect, and often the very gift or return of conjugal love, for, as has forcibly been asserted of marriage where conception or the birth of children is intentionally prevented, such is, in reality, but legalized prostitution, a sensual rather than a spiritual union.

Who can deny these premises? The experience of every physician confirms them, as do a glance throughout every circle of society, and the experience, personal or by observation, of almost every nurse, every matron, every mother. Let us then, physicians and the community, meet each other half way—ready to acknowledge, upon due evidence, the frightful extent of the evil that exists in our homes—an evil, in part occasioned by ignorance and carelessness, and that we are both, in a measure, accountable for, and ready to assist each other in its cure. I propose to show that induced abortions are not only a crime against life, the child being always alive, or practically supposed to be so; against the mother,

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for the laws do not allow suicide, or the commission of acts upon one's own person involving great risk to life; against nature and all natural instinct, and against public interests and morality, but that, barring ethical considerations, and looked at in a selfish light alone, they are so dangerous to the woman's health, her own physical and domestic best interests, that their induction, permittal, or solicitation by one cognizant of their true character, should almost be looked upon as proof of actual insanity.

II.—WHAT HAS BEEN DONE BY PHYSICIANS TO FOSTER, AND WHAT TO PREVENT THIS EVIL.

In our appeal we shall endeavor to go straight toward the mark, nothing concealing, undervaluing, or selfishly excusing. And, first of all, what part have physicians had in this great tragedy, wherein so many women have been chief players? For it is to the medical attendant that the community have a right to look for counsel, for assistance, and for protection, and the present is an evil more especially and directly coming within these bounds.

From time immemorial, such have been the deplorable tendencies of unbridled desire, of selfishness and extravagance, of an absence of true conjugal affection, that there has existed in countless human breasts a wanton disregard for fœtal life, a practical approval of infanticide. This has, however, in the main been confined either to savage tribes, or to nations, like the Chinese, with a redundant population, with each of whom the slaughter of children after their birth is common, or to the lowest classes of more civilized communities, impelled either by shame, or, as in the burial clubs of the London poor, the revelations of which a year or two since so startled the world, by the stimulus of comparatively excessive pecuniary gain.

That infanticide is of occasional occurrence in our own country, the effect of vice or of insanity, has long been known; instances being occasionally brought to the surface of society and to notice by the police, and through courts of law.

The closely allied crime of abortion also dates back through all history; like every other form or fruit of wickedness, originating in those deep-lying passions coeval with the existence of mankind. Till of late, however, even physicians, who from time to time have accidentally become cognizant of an isolated instance, have sup-

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posed or hoped, and here the wish was father to the thought, that the evil was of slight and trivial extent, and, therefore, and undoubtedly with the feeling that a thing so frightful and so repugnant to every instinct should be ignored, the profession have until within a few years preserved an almost unbroken silence upon the subject.

Some ten years since this matter was thoroughly taken in hand by a physician much interested in the diseases of women, the younger Dr. Storer, of Boston, with the frank acknowledgment that it was to his father, the Professor of Midwifery in Harvard University, that the credit of initiating the anti-abortion movement in New England was justly due. Prof. Hodge, of Philadelphia, like the elder Dr. Storer, had previously commented in a public lecture to his class, afterwards printed, upon the immorality and frequency of induced miscarriage; and in Europe one or two physicians of eminence, as Dr. Radford, had endeavored to arouse the profession to the real value of fœtal life. The subject had also received some slight attention in works upon medical jurisprudence, but in special treatises upon abortion and sterility, their causes and treatment, of which the most celebrated has been that of Dr. Whitehead, of England, the chance of this occurrence and condition being dependent upon a criminal origin had been almost entirely lost sight of. In investigating the cases of disease in the better classes that came under observation, it was now ascertained that a very large proportion of them were directly owing to a previous abortion, and that in many of them this occurrence had been intentional; the physician's consultation room proving in reality a confessional, wherein, under the implied pledge of secrecy and inviolate confidence, the most weighty and at times astounding revelations are daily made. In such instances as those to which we are now referring, the disclosures are in answer to no idle curiosity, but to the necessity which always exists of knowing and understanding every point relating to the causation, the treatment, the cure of obscure disease.

The profession were soon aroused to an appreciation of facts whose existence it was shown could so easily be proved by every physician, and in 1857 a committee, consisting of some of the more prominent and most reliable practitioners in various parts of the country, with the younger Storer as chairman, was appointed by the American Medical Association, at its meeting in Nashville, to

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investigate the crime with a view to its possible suppression.[1] The report of this committee was rendered at Louisville, in 1859, and, supported as it was by a mass of evidence of almost boundless scope, the measures proposed, chiefly of a legislative character, were unanimously indorsed by the Association. The evidence upon which the report was based was subsequently published at Philadelphia, as a separate volume, "the first of a series of contributions to Obstetric Jurisprudence" by its writer, under the title of "Criminal Abortion in America," and was feelingly dedicated "to those whom it may concern—Physician, Attorney, Juror, Judge, and Parent."

This detail, otherwise out of place in an appeal to the community, is rendered perhaps necessary, that an exact and true impression may be given of the steps that have been taken by medical men, to redeem themselves from the imputation of having been sluggish guardians of the public weal. Since the time of the Louisville report, the profession have been fully alive to the claims of the subject, and it is not with unnatural satisfaction that its author, in a subsequent publication,[2] has taken occasion to observe that the importance and legitimacy of the investigation has now been acknowledged in the current files of every medical journal, in the published transactions of the national and minor medical associations, in many medical addresses, as that by Dr. Miller, of Louisville, at the meeting of the Association at New Haven, in 1860, and in nearly every general obstetric work of any importance issued in this country since that date, Bedford's *Principles and Practice of Obstetrics*, for instance, and in many works of criminal law and medical jurisprudence, as Elwell, Wharton and Stillé, and Hartshorne's edition of Taylor, to a much greater extent than the subject in these works had ever been treated before.

I am constrained to acknowledge my indebtedness to the various publications of the writer from whom I have quoted, for much of the evidence I shall now present upon the subject of forced abortions. I trust that thus offered it may lose none of its freshness, point, and force. My frequent extracts from one who has given more thought to the subject than probably any other person in the country, will I am sure need no excuse.

[1] The committee consisted of Drs. H. R. Storer, of Boston; T. W. Blatchford, of Troy, N. Y.; H. L. Hodge, of Philadelphia; C. A. Pope, of St. Louis; Barton, of South Carolina; A. Lopez, of Mobile; and W. H. Brisbane, of Arena, Wisconsin.

[2] Studies of Abortion, Boston Medical and Surgical Journal, February 5, 1863.

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An opinion has obtained credence to a certain extent, and it has been fostered by the miserable wretches, for pecuniary gain, at once pandering to the lust and fattening upon the blood of their victims, that induced abortions are not unfrequently effected by the better class of physicians. Such representations are grossly untrue, for wherever and whenever a practitioner of any standing in the profession has been known, or believed, to be guilty of producing abortion, except absolutely to save a woman's life, he has immediately and universally been cast from fellowship, in all cases losing the respect of his associates, and frequently, by formal action, being expelled from all professional associations he may have held or enjoyed.

The old Hippocratic oath, to which each of his pupils was sworn by the father of medicine, pledged the physician never to be guilty of unnecessarily inducing miscarriage. That the standard, in this respect, of the profession of the present day has not deteriorated, is proved by the first of the resolutions adopted by the Convention at Louisville, in 1859: "That while physicians have long been united in condemning the procuring of abortion, at every period of gestation, except as necessary for preserving the life of either mother or child, it has become the duty of this Association, in view of the prevalence and increasing frequency of the crime, publicly to enter an earnest and solemn protest against such unwarrantable destruction of human life."[1]

It is true, however, that while physicians are unanimous as to the sanctity of fœtal life, they have yet to a certain extent innocently and unintentionally given grounds for the prevalent ignorance upon this subject to which I shall soon allude. The fact that in some cases of difficult labor, it becomes imperatively necessary to remove the child piecemeal, if dead, or, if living, to destroy it for the sake of saving the mother's life, ought not to imply that the physician has attached a trifling value to the child itself. Compared with the mother, who is already mature and playing so important a part in the world, he justly allows the balance to fall, but he fully recognizes that he is assuming a tremendous responsibility, that his action is only justified by the excuse of dire necessity, and he suffers, if he is a man of any sensibility and feeling, an amount of mental anguish not easily to be described, and that none of us, who have been compelled to so terrible a duty, need feel ashamed to confess.

[1] Transactions of the American Medical Association, 1859, Vol. XII. p. 75.

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There are cases again, where, during pregnancy, the patient may be reduced by the shock of severe and long-continued pain or excessive vomiting, and its consequent inanition, to the verge of the grave. In such instances, it has been supposed that abortion was necessary to preserve the woman's life. The advance of science, however, has now shown that this procedure is not only often unnecessary, but in reality unscientific; the disturbances referred to occurring, as they generally do, in the earlier months of gestation, being due not to the direct pressure of the womb upon the stomach or other organs, but to a so-called reflex and sympathetic disturbance of those organs, through the agency of the nervous system; and that a cure can in general be readily effected without in any way endangering the vitality of the child.

There are other instances that might be cited, cases of dangerous organic disease, as cancer of the womb, in which, however improbable it might seem, pregnancy does occasionally occur; cases of insanity, of epilepsy, or of other mental lesion, where there is fear of transmitting the malady to a line of offspring; cases of general ill health, where there is perhaps a chance of the patient becoming an invalid for life, but for all these and similar emergencies, there is a single answer, and but this one—that abortion, however it may seem indicated, should never be induced by a physician upon his own uncorroborated opinion, and, in a matter so grave, affecting, with his own reputation, the life of at least one if not of a second human being, every man worthy of so weighty and responsible a trust will seek in consultation a second opinion. This is a matter of such importance to the welfare of the community, that long ago the law should have provided for its various dangers, and should wisely have left it to no man's discretion or purity of character to withstand the tremendous temptations which must be allowed to here exist. The law now provides, in one or more of our States at least, that the certificate of a single physician, no matter what his skill or standing, cannot commit a patient to the often necessary and beneficial seclusion of a lunatic asylum; two are required. How much more requisite is it that in the question we are now considering, to one mode of deciding which the physician may be prompted by pity, by personal sympathy, the entreaties of a favorite patient, and not seldom by the direct offer of comparatively enormous pecuniary compensation, the law should offer him its protecting shield, saving him even from himself and helping him to see that the fee for an unnecessarily induced or allowed abortion

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is in reality the price of blood. As a class, it cannot be gainsaid that physicians of standing will spurn with indignation the direct bribe; let them look to it that they never carelessly permit what they condemn, by endeavoring to bring on the woman's periodical discharge when it is possible that she may have conceived, or by carelessly passing an instrument into her womb without ascertaining whether or no it contain the fruit of impregnation, or by allowing the completion of a miscarriage that may threaten or even have commenced, without resorting to every measure, of whatever character, that can possibly result in its arrest and the consequent completion of the full period.

III.—WHAT IS THE TRUE NATURE OF AN INTENTIONAL ABORTION WHEN NOT REQUISITE TO SAVE THE LIFE OF THE MOTHER.

There are those who will be influenced by evidence presented from abstract morality and religion. To such I shall first address myself. There are others who care nothing for ethical considerations, and who arrogate to themselves a right to decide as to the morality of taking or destroying the life of an unborn child. For these also I have an unanswerable argument—their own self-interest—an appeal to which will usually arrest the most hardened adept in other crime, much more these intelligent and otherwise innocent women, who have mostly erred through ignorance and a misapprehension of their own physical condition, and their own physical dangers, their own physical welfare.

Physicians have now arrived at the unanimous opinion, that the fœtus in utero is *alive* from the very moment of conception.

"To extinguish the first spark of life is a crime of the same nature both against our Maker and society, as to destroy an infant, a child, or a man."[1]

More than two hundred years ago the same idea was as vigorously as quaintly expressed. "It is a thing deserving all hate and detestation that a man in his very originall, whiles he is framed, whiles he is enlived, should be put to death under the very hands and in the shop of nature."[2]

The law, whose judgments are arrived at so deliberately, and usually so safely, has come to the same conclusion, and though in some of its decisions it has lost sight of this fundamental truth, it

[1] Percival: Medical Ethics, p. 79.
[2] Man Transformed, Oxford, 1653.

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has averred in most pithy and emphatic language that "quick with child is having conceived."[1]

By that higher than human law, which, though scoffed at by many a tongue, is yet acknowledged by every conscience, "the wilful killing of a human being, at any stage of its existence, is murder."[2]

Abortion or miscarriage is known by every woman to consist of the premature expulsion of the product of conception. It is not as well known, however, if the statements of patients are to be relied upon, that this product of conception is in reality endowed with vitality from the moment of conception itself. It is important, therefore, to decide in what the moment of conception consists. It has now been ascertained that every variety of animal life originates from an egg, even primarily those lowest forms in which occur the phenomena of so-called alternate generation; in each and every one of them, mammals or invertebrates, the origin is from as distinct an egg as is laid by bird, tortoise, or fish; the human species being no exception to this general rule. Before this egg has left the woman's ovary, before impregnation has been effected, it may perhaps be considered as a part and parcel of herself, but not afterwards. When it has reached the womb, that nest provided for the little one by kindly nature, it has assumed a separate and independent existence, though still dependent upon the mother for subsistence. For this end the embryo is again attached to its parent's person, temporarily only, although so intimately, that it may become nourished from her blood, just as months afterwards it is from the milk her breasts afford. This is no fanciful analogy; its truth is proved by countless facts. In the kangaroo, for instance, the offspring is born into the world at an extremely early stage of development, "resembling an earthworm in its color and semi-transparent integument,"[3] and then is placed by the mother in an external, abdominal, or marsupial pouch, to portions of which corresponding, so far as function goes, at once to teats and to the uterine sinuses, these embryos cling by an almost vascular connection until they are sufficiently advanced to bear detachment, or in reality to be born. The first impregnation of the egg, whether in man or in the kangaroo, is the birth of the offspring to life; its emergence into the outside world for wholly separate existence is,

[1] Regina *v.* Wycherly, 8 Carrington and Payne, 265.

[2] Criminal Abortion in America, p. 5.

[3] Owen: Cyclopædia of Anatomy and Physiology, iii. p. 322.

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for one as for the other, but an accident in time. It has been asserted by some authors, as by Meigs, that conception is only coincident with the attachment of the impregnated egg to the uterine cavity for its temporary abode therein, or, in exceptional cases, as in extra-uterine pregnancy so called, with its attachment to some other tissue of the mother; thereby attempting to establish a difference between impregnation and conception; a difference that is at once philosophically unfounded, and plainly disproved by all analogical evidence, as the fact, for instance, that in most fishes impregnation occurs entirely external to the body of the mother, from which the ova had previously, or during the process of copulation, permanently been discharged.

Many women suppose that the child is not alive till quickening has occurred, others that it is practically dead till it has breathed. As well one of these suppositions as the other; they are both of them erroneous.

Many women never quicken at all, though their children are born living; others quicken earlier or later than the usual standard of time; or, others again may in their own persons have noticed either or all of these peculiarities in different pregnancies. Quickening is in fact but a sensation, the perception of the first throes of life—but of a twofold occurrence, and this not merely the motion of the child, but often the sudden emergence of the womb upwards from its confinement in the low regions of the pelvis into the freer space of the abdomen. The motions of the child, which have been proved by Simpson, of Edinburgh, to be its involuntary efforts, through the reflex action of its nervous system, to retain itself in certain attitudes and positions essential to its security, its sustenance, and its proper development, are usually present for a period long prior to the possibility of their being perceived by the parent. They may very constantly be recognized by the physician in cases where no sensation is felt by the mother, and the fœtus has been seen to move when born, during miscarriage, at a very early period.

During the early months of pregnancy, while the fœtus is very small in proportion to the size of the cavity which contains it, sounds, produced by its movements, may be distinguished by the attentive ear applied to the abdomen of the mother, as gentle taps repeated at intervals, and continued uninterruptedly for a considerable time. These sounds may sometimes be heard several weeks before the usual period of the mother's becoming conscious of the

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motion of the child, and also earlier than the pulsations of the fœtal heart or the uterine souffle,[1] as the murmur of the circulation in the walls of that organ, or in the tissue of the after-birth, is technically termed. These motions must be allowed to prove life, and independent life. In what does this life really differ from that of the child five minutes in the world? Is not then forced abortion a crime? Moreover, instances have occurred where, the membranes having been accidentally ruptured, the child has breathed, and even cried, though yet unborn, as proved alike by the sounds within the mother, well authenticated by bystanders, and by auscultation of her abdomen, and by the fact that sometimes, when not born living, the lungs of the fœtus have been found fully expanded, a process which can be effected only by respiration, and of which the proofs are such as can be occasioned in no other way whatever.

In the majority of instances of forced abortion, the act is committed prior to the usual period of quickening. There are other patients, who have confessed to me that they have destroyed their children long after they have felt them leap within their womb. There are others, still, whom I have known to wilfully suffocate them during birth, or to prevent the air from reaching them under the bedclothes; and there are others, who have wilfully killed their wholly separated and breathing offspring, by strangling them or drowning them, or throwing them into a noisome vault. Wherein among all these criminals does there in reality exist any difference in guilt?

I would gladly arrive at and avow any other conviction than that I have now presented, were it possible in the light of fact and of science, for I know it must carry grief and remorse to many an otherwise innocent bosom. The truth is, that our silence has rendered all of us accessory to the crime, and now that the time has come to strip down the veil and apply the searching caustic or knife to this foul sore in the body politic, the physician needs courage as well as his patient, and may well overflow with regretful sympathy.

That there has existed a wide and sincere ignorance of the true character of the act, I have already allowed; it is a point to which I shall again refer. At present let us turn from the crime against the child, to the crime as against the mother's own life and health. I here refer more particularly to her own agency therein. Of the guilt of abortion when committed by another person than herself,

[1] Naegele: Treatise on Obstetric Auscultation, p. 50.

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and with reference both to the mother's life and that of the child, there can be no doubt, but it is with the woman's own agency in the act, as principal, or accessory by its solicitation or permission, that we have now to deal; not as to its abstract wrong alone, but as to its physical dangers and therefore its utter folly.

IV.—THE INHERENT DANGERS OF ABORTION TO A WOMAN'S HEALTH AND TO HER LIFE.

It is generally supposed, not merely that a woman can wilfully throw off the product of conception without guilt or moral harm, but that she can do it with positive or comparative impunity as regards her own health. This is a very grievous and most fatal error, and I do not hesitate to assert, from extended observation, that, despite apparent and isolated instances to the contrary—

1. A larger proportion of women die during or in consequence of an abortion, than during or in consequence of childbed at the full term of pregnancy;

2. A very much larger proportion of women become confirmed invalids, perhaps for life; and

3. The tendency to serious and often fatal organic disease, as cancer, is rendered much greater at the so-called turn of life, which has very generally and not without good reason been considered as especially the critical period of a woman's existence.

These, as I have said, are conclusions that cannot be gainsaid, as they are based on facts; and that these facts are merely what ought in the very nature of things to occur, can readily enough be shown.

1. Nature does all her work, of whatever character it may be, in accordance with certain simple and general laws, any infringement of which must necessarily cause derangement, disaster, or ruin.

In the present instance, it has been ascertained, by careful dissections and microscopic study, that the woman's general system, both as a whole and as regards each individual organ and its tissues, is slowly and gradually prepared for the great change which naturally occurs at the end of nine months' gestation; and that if this change is by any means prematurely induced, whether by accident or design, it finds the system unprepared. Not even do I except from this law the earlier months of pregnancy; when, it is thought by so many, that abortion can be brought on without any physical shock.

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During pregnancy all the vital energies of the mother are devoted to a single end, the protection and nourishment of the child. Such wise provision is made for its security, such intimate vascular connection is established between the fœtal circulation and the blood-vessels of the mother, that its premature rupture is usually attended by profuse hemorrhage, often fatal, often persistent to a greater or less degree for many months after the act has been completed, and always attended with more or less shock to the maternal system, even though the full effect of this is not noticed for years.

In birth at the full period, it is found that what is called by pathologists fatty degeneration of the tissues occurs both in the walls of the mother's womb, and in the placenta or after-birth, by which attachment is kept up with the child. This change, in all other instances a diseased process, is here an essential and healthy one. By it the occurrence of labor at its normal period is to a certain extent determined; by it is provision made against an inordinate discharge of blood during the separation and escape of the after-birth, and by it is the return of the uterus to the comparatively insignificant size, that is natural to it when unimpregnated, insured. Any deviation from this process at the full term, which prevents the whole chain of events now enumerated from being completed, lays the foundation of, and causes, a wide range of uterine accidents and disease, displacements of various kinds, falling of the womb downwards or to either side, with the long list of neuralgic pains in the back, groins, thighs, and elsewhere that they occasion; constant and inordinate leucorrhœa; sympathetic attacks of ovarian irritation, running even into dropsy, etc. etc. These are only a portion of the results that might be enumerated.

Now while all this is true of any interference with the natural process at the full time, it is just as true, and if anything more certain, when pregnancy has been prematurely terminated; and out of many hundred invalid women, whose cases I have critically examined, in a very large proportion I have traced these symptoms to the mental conviction of the patient, as well as to my own, directly back to an induced abortion.

Again—not merely does nature prepare the appendages of the child and the womb of its mother for the separation that in due time is to ensue between them, it also provides an additional means of insuring its successful accomplishment, through the action that takes place in the woman's breasts, namely, the secretion of the milk. Though the escape of this fluid does not ordinarily

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occur in any quantity until some little time after birth has been effected, yet the changes that ensue have gradually been progressing for days or weeks or even months; for, as is well known, in some women the lacteal secretion is present before birth, at times even during a large part of pregnancy, and in all women there is doubtless a decided tendency of the circulation towards the breasts, prior to the birth of the child, just as there has been so extreme a tendency of the circulation for so long a time towards the womb. It is indeed to take the place of the latter that the former is established, and to prevent the evil consequences that might otherwise ensue. The sympathy between the mammary glands and the uterus is now well established; it is shown in many different ways: in some women the application of the child to the breasts is immediately followed by after-pains, and in others these pains, which are usually but contractions of the womb to expel any clots that may have accumulated, are attended by a freer secretion or discharge of the milk. It is not uncommon when the monthly discharge is scanty or suddenly checked, for the breasts to become enlarged and painful, as is so often the case soon after impregnation, while on the other hand one of the most efficient means we have of establishing the periodical flow, when suppressed, is by the application of sinapisms to the surface of the breasts. In view of these facts it will readily be understood why it is that women who make good nurses are so much less likely than others to suffer from the various disorders of the womb, and why they are also less likely to rapidly conceive, and why, moreover, too long lactation should not be indulged in for either of these so desirable ends. The demands of fashion shorten or prevent nursing, the demands of fashion often forbid a woman from bearing children; but whether this is attained by the prevention of impregnation, or by the induction of miscarriage, it is almost inevitably attended, as is to a certain extent the sudden cessation of suckling, by a grievous shock to the mother's system, that sooner or later undermines her health, if even it does not directly induce her death.

I have asserted that dangers attend the occurrence of abortion which directly threaten a mother's life. This is true of all miscarriages whether accidental or otherwise; but these dangers are enhanced when the act is intentional. When caused by an accident, the disturbance is often of a secondary character, the vitality of the ovum being destroyed or the activity of the maternal circulation checked before the separation of the two beings from each

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ther finally takes place. But in a forced abortion there is no uch preservative action; the separation is immediate if produced y instruments, which often besides do grievous damage to the issues of the mother with which they are brought into contact, acerating them and often inducing subsequent sloughing or mor- ification; or, if the act is effected by medicines, it is usually in consequence of violent purgation or vomiting, which of themselves often occasion local inflammation of the stomach or intestines, and death. Add to this that even though the occurrence of any such feeling may be denied, there is probably always a certain measure of compunction for the deed, in the woman's heart—a touch of pity for the little being about to be sacrificed—a trace of regret for the child, that, if born, would have proved so dear—a trace of shame at casting from her the pledge of a husband's or lover's affection—a trace of remorse for what she knows to be a wrong, no matter to what small extent, or how justifiable, it may seem to herself, and we have an explanation of the additional element in these intentional abortions, which increases the evil effect upon the mother, not as regards her bodily health alone, but in some sad cases to the extent even of utterly overthrowing her reason.

The causes of an immediately or secondarily fatal result of labor at the full period are few; in abortion nearly every one of these is present, with the addition of others peculiar to the sudden and untimely interruption of a natural process and the death of the product of conception. There is the same or greater physical shock, the same or greater liability to hemorrhage, the same and much greater liability to subsequent uterine or ovarian disease. To these elements we must add another and by no means an unimportant one; a degree of mental disturbance, often profound, from disappointment or fear, that to the same extent may be said rarely to exist in labors at the full period.[1]

Viewing this subject in a medical light, we find that death, however frequent, is by no means the most common or the worst result of the attempts at criminal abortion. This statement applies not to the mother alone, but, in a degree, to the child.

We shall perceive that many of the measures resorted to are by no means certain of success, often indeed decidedly inefficacious in causing the immediate expulsion of the fœtus from the womb; though almost always producing more or less severe local or

[1] Studies of Abortion, Boston Med. and Surg. Journ., Feb. 5, 1863.

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general injury to the mother, and often, directly or by sympathy, to the child.

The membranes or placenta may be but partially detached, and the ovum may be retained. This does not necessarily occasion degeneration, as into a mole, or hydatids, or entire arrest of development. The latter may be partial, as under many forms, from some cause or another, does constantly occur; if from an unsuccessful attempt at abortion, would this be confessed, or indeed always suggest itself to the mother's own mind? Fractures of the fœtal limbs prior to birth are often reported, unattributable in any way to the funis, which may amputate, indeed, but seldom break a limb. A fall or a blow is recollected; perhaps it was accidental, perhaps not, for resort to these for criminal purposes is very common. In precisely the same manner may injury be occasioned to the nervous system of the fœtus, as in a hydrocephalic case long under the writer's own observation, where the cause and effect were plainly evident. Intra-uterine convulsions have been reported; as induced by external violence they are probably not uncommon, and the disease thus begun may eventuate in epilepsy, paralysis, or idiocy.

To the mother there may happen correspondingly frequent and serious results. Not alone death, immediate or subsequent, may occur from metritis, hemorrhage, peritonitic or phlebitic inflammation, from almost every cause possibly attending not merely labor at the full period, comparatively safe, but miscarriage increased and multiplied by ignorance, by wounds, and violence; but if life still remain, it is too often rendered worse than death.

The results of abortion from natural causes, as obstetric disease, separate or in common, of mother, fœtus or membranes, or from a morbid habit consequent on its repetition, are much worse than those following the average of labors at the full period. If the abortion be from accident, from external violence, mental shock, great constitutional disturbance from disease or poison, or even necessarily induced by the skilful physician in early pregnancy, the risks are worse. But if, taking into account the patient's constitution, her previous health, and the period of gestation, the abortion has been criminal, these risks are infinitely increased. Those who escape them are few.

In thirty-four cases of criminal abortion reported by Tardieu, where the history was known, twenty-two were followed, as a con-

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sequence, by death, and only twelve were not. In fifteen cases necessarily induced by physicians, not one was fatal.

It is a mistake to suppose, with Devergie, that death must be immediate, and owing only to the causes just mentioned. The rapidity of death, even where directly the consequence, greatly varies; though generally taking place almost at once if there be hemorrhage, it may be delayed even for hours where there has been great laceration of the uterus, its surrounding tissues, and even of the intestines; if metro-peritonitis ensue, the patient may survive for from one to four days, even indeed to seven and ten. But there are other fatal cases, where on autopsy there is revealed no appreciable lesion; death, the penalty of unwarrantably interfering with nature, being occasioned by syncope, by excess of pain, or by moral shock from the thought of the crime.

That abortions, even when criminally induced, may sometimes be safely borne by the system, is of little avail to disprove the evidence of numberless cases to the contrary. We have instanced death. Pelvic cellulitis, on the other hand, fistulæ, vesical, uterine, or between the organs alluded to; adhesions of the os or vagina, rendering liable subsequent rupture of the womb, during labor or from retained menses, or, in the latter case, discharge of the secretion through a Fallopian tube and consequent peritonitis; diseases and degenerations, inflammatory or malignant, of both uterus and ovary; of this long and fearful list, each, too frequently incurable, may be the direct and evident consequence, to one patient or another, of an intentional and unjustifiable abortion.

We have seen that in some instances, the thought of the crime, coming upon the mind at a time when the physical system is weak and prostrated, is sufficient to occasion death. The same tremendous idea, so laden with the consciousness of guilt against God, humanity, and even mere natural instinct, is undoubtedly able, where not affecting life, to produce insanity. This it may do either by its first and sudden occurrence to the mind; or, subsequently, by those long and unavailing regrets, that remorse, if conscience exist, is sure to bring. Were we wrong in considering death the preferable alternative?[1]

To the above remarks it might truthfully be added, that not only is the fœtus endangered by the attempt at abortion, and the mother's health, but that the stamp of disease thus impressed is very apt to

[1] Criminal Abortion in America, p. 42.

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be perceived upon any children she may subsequently bear. Not only do women become sterile in consequence of a miscarriage; and then, longing for offspring, find themselves permanently incapacitated for conception; but, in other cases, impregnation, or rather the attachment of the ovum to the uterus, being but imperfectly effected, or the mother's system being so insidiously undermined, the children that are subsequently brought forth are unhealthy, deformed, or diseased. This matter of conception and gestation, after a miscarriage, has of late been made the subject of special study, and there is little doubt that from this, as the primal origin, arises much of the nervous, mental, and organic derangement and deficiency, that, occurring in children, cuts short or embitters their lives.

It may be alleged by those who, sceptical or not sceptical as to these conclusions, have reason nevertheless to desire to throw discredit upon them, that the weekly or annual bills of mortality, the mortuary statistics, do not show such direct influence from the crime of abortion as I have claimed exists.

On the other hand, it must not be forgotten that in these cases there always is present every reason for concealment. In the earlier months of pregnancy it is very difficult to prove, in the living subject, that pregnancy has occurred. Such a conclusion being arrived at, before the sound of the fœtal heart can be heard, for this is the only sign that is positively certain, by merely circumstantial and probable evidence, which becomes of weight only as it is accumulated and found corroborative. In the dead subject, the victim of an abortion in the earlier months, the case is often equally obscure, or at least doubtful, unless the product of conception has not yet escaped, or having been thrown off has been detected or preserved. When found, it of course proves pregnancy, whether the parent be living or dead; that is, in the former instance, if its discharge can be traced directly to the woman in question, and to no other, and correlative circumstances may show that an abortion has occurred; but this may have been accidental and guiltless. Where the act has been committed by an accomplice, the proofs of such commission and of the intent, though this is generally implied by the act itself, are by no means always forthcoming. Where the abortion has been induced by the woman herself, as is now so frequently the case, certainty upon the point becomes far more difficult. The only positive evidence by which to judge of the real frequency of the crime is *confession*, and it is

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from the confessions of many hundreds of women, in all classes of society, married and unmarried, rich and poor, otherwise good, bad, or indifferent, that physicians have obtained their knowledge of the true frequency of the crime.

The confidential relations in which the physician stands to his patient; the understanding that nothing can wring from him her disclosures, save the direct commands of the law, so unlikely in any given case to become cognizant of its existence, elicit from a woman in almost every instance, especially if she believes herself in peril of death, a frank statement of the means by which she has been brought low; for it is evident, that upon such knowledge must depend the measures of relief to which the physician may resort. Could the test of confession be always applied, as is, however, manifestly impossible, so many women die during or in consequence of an abortion, without the attendance of a physician and without making any sign, it would be found that many of the cases now reported upon our bills of mortality as deaths from hemorrhage, from menorrhagia, from dysentery, from peritonitis, from inflammation of the bowels or of the womb, from obscure tumor, or from uterine cancer, would be found in reality to be deaths from intentional abortion. At first sight, it would seem impossible that such grossly erroneous opinions as the above could be rendered; but their likelihood is readily perceived when it is recollected how often, when the best medical skill has been secured, attending circumstances are such as to excite little or no suspicion of the true state of the case, and a physical examination of the patient is therefore neglected. Women are still allowed to die of ovarian or of other tumors that might be easily and successfully removed, and in default of a proper examination are sometimes mistakenly pronounced instances of disease of the liver or of ordinary abdominal dropsy, and as such are buried. If such and similar errors can occur in chronic cases, where time and opportunity have permitted the most thorough examination and study, still more likely are they to take place during the hurry and anxieties of an acute and alarming attack, where the conscience and shame of the patient are alike interested in causing or keeping up a deception.

It will have been seen then, not merely that an induced abortion may be attended with great immediate danger to the mother, but that in reality it is very often fatal, either from the so-called shock to her system, or from hemorrhage, or from immediately ensuing peritonitis.

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2. Should the woman survive these immediate consequences, no matter how excellently she may have seemed to rally, she is by no means safe as to her subsequent health. There are a host of diseases, some of them very dangerous, to which she is directly liable.

The product of conception is not always entirely gotten rid of. If a fragment remains, no matter how trifling in size, it may serve as the channel of a most severe and constant hemorrhagic discharge. Of this, examples are by no means infrequent; the flux lasting at times for very many months, and, if the cause is not finally detected and removed, hurrying the patient to her grave.

The product of conception is sometimes retained entire, after its detachment from the uterine walls has been supposed wholly effected. It may be carried for many years, always acting as a foreign body; at times occasioning extreme irritation, shown perhaps only by distant and otherwise inexplicable symptoms, or it may lie dormant for a time without apparent trouble—finally making itself known by some sudden explosion of disease, whether by purulent absorption and general pyæmia; by ulceration and discharge of fœtal debris, through the intestines, bladder, or even abdominal integuments; or by metritic inflammation, followed by sympathetic or consequent fatal peritonitis.

The patient after an abortion is very liable to one or another of the forms of uterine displacement, which are now known to lie at the foundation of so very large a proportion of the lame backs, formerly supposed consequent on spinal irritation; of the painfully neuralgic breasts, so often suggestive of incipient cancer; of the disabled limbs, pronounced affected with sciatica, cramps or even paralysis; of the impatient bladders, from whose irritability or incontinence the kidneys are supposed diseased; of the obscure abdominal aches and pains, which unjustly condemn so many a liver and so many an ovary; of the constipation from mere mechanical pressure, which is so often thought to argue stoppage from stricture or other organic disease; of the severe and intractable headaches that, resisting all and every form of direct or constitutional treatment, are supposed to indicate an incurable affection of the brain; of the easily deranged stomachs, that are so suggestive of ulceration or of malignant degeneration; of the general hypochondria and despondency, that of the most gentle, even almost angelic, dispositions make the shrew and virago, and of the purest and most innocent produce, in her own conceit, the worst of sinners, even at times effecting suicide. Who that has suffered will think this

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picture overdrawn? Who that has practised will not recognize in displacements, the key by which these riddles may be solved?

Their mode of causation is plain. After an abortion, just as after labor at the full term, the womb is more weighty than natural —its walls thicker and heavier than usual, caused alike by the excess of blood they contain, and by the increased deposition of muscular fibre. After childbed, it has been shown that this increase is normally lessened by certain physiological processes attending the natural completion of that function. After an abortion, these processes are absent or are but imperfectly performed. It is notorious that during the slight increase of weight from simple congestion that occurs at the regular monthly periods, women are very liable to displacement on any effort, extreme or slight, whether riding on horseback, gently lifting, or even straining at stool; during or after an abortion, the risk is very greatly increased.

With equal justice could I refer to the chances of trouble that otherwise accompany the premature ending of pregnancy. In many instances, I have now been summoned to attend, and frequently to operate upon, the consequences of local uterine or vaginal inflammation or of laceration, for both of these results may ensue where the womb has not been prepared to evacuate itself by the normal closure of pregnancy—and this, whether or not instruments may have been employed. Adhesions of varying situation and extent are not uncommon as the result of an abortion. They may be slight, and merely tilt or draw the womb to one side, giving rise only to severe local or distant neuralgia, and rendering the occurrence of a subsequent pregnancy somewhat dangerous; they may be more decided, and as bridles or septa partially close the canal of the vagina, rendering menstruation and conjugal intercourse alike difficult and painful; they may be so complete as entirely to obliterate the mouth of the womb or of the external passage, in these instances preventing the escape of the menses and rendering an operation necessary to avoid a rupture that might perhaps be fatal. Should it be the outer entrance that is occluded, the woman is of course entirely shut off from her husband's embrace, an effect that, however grateful to many an invalid, her shame would hardly be willing to accept as the consequence of disease.

These that I have mentioned are but a tithe of the pathological effects daily revealed to physicians, as consequent upon an intentional abortion. They are, however, sufficient for our purpose.

3. But not merely is a woman in peril both as to life and health,

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alike at the time of an abortion and for months or years subsequently. She may seem to herself and to others successfully to have escaped these dangers, and yet when she has reached the critical turn of life, succumb.

At this eventful period, when the fountains of youth dry up, and the scanty circulation is turned from its accustomed channel, the woman ceases from the periodical discharges, which in health and with care are the secret of her beauty, her attractions, her charms. At its occurrence not merely is a change produced in the system generally, but the womb, no longer required, becomes atrophied and dwindles into insignificance. It may have had impressed upon it, years and years back, the stamp of derangement, till now not rendered effective; for, as in other portions of the body, a part once weakened may retain itself in tolerably good condition until some accident or other change develops or awakens the seed of disease. Thus it is that an ancient hypertrophy, or a chronic irritation, may become scirrhous and degenerate into undoubted carcinoma, or chronic menorrhagia or uterine leucorrhœa become intractable hemorrhage, or a latent fibroid deposit develop into an irrepressible and, perhaps, irremediable tumor.

Little the comfort for a woman to have had her own way against the dictates of her conscience, the advice, perhaps, of her physician, if to the dangers she must directly incur, she must add the looking forward through all the rest of her life to possible disease, invalidism, or death as the direct consequence of her folly; no wonder if she should consider prevention better than such cure as this, and yet the prevention of pregnancy, by whatever means it may be sought, by cold vaginal injections, or by incomplete or impeded sexual intercourse, is alike destructive to sensual enjoyment and to the woman's health; her only safeguard is either to restrict approach to a portion of the menstrual interval, or to refrain from it altogether.

Not merely are certain of the measures to which I have alluded detrimental to the health of the woman, they are so to both parties engaged, and it is to their frequent employment, freely confessed as this is to the physician, that much of the ill health of the community, both of men and women, is to be attributed. Though they may seem sanctioned by the rites of marriage, they are in some respects worse for the physical health, I might almost say for the moral health likewise, than illicit intercourse or even prostitution, for they bring both parties down to all the evils and dangers, mental and physical, of self-abuse.

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V.—THE FREQUENCY OF FORCED ABORTIONS, EVEN AMONG THE MARRIED.

All are familiar with the fact, to be perceived everywhere upon the most casual scrutiny, that the standard size of families is not on the average what used to be seen, in other words, that instances of an excess over three or four children are not nearly as common as we know was the case a generation or two back. No one supposes that men or women have, as a whole, so deteriorated in procreative ability as this might otherwise seem to imply.

There can be but one solution to the problem, either that pregnancies are very generally prevented, or that, occurring, they are prematurely cut short. We have seen that countless confessions prove that this surmise is true.

In the treatise to which we have already alluded, its author has shown by a series of unanswerable deductions, based on material gathered from many sources both at home and abroad, that forced abortions in America are of very frequent occurrence, and that this frequency is rapidly increasing, not in the cities alone, but in the country districts where there is less excuse on the ground of excessive expenditures, the claims of fashionable life, or an overcrowding of the population. It was proved, for instance, that in one State that was named, one of the wealthiest in the Union, the natural increase of the population, or the excess of the births over the deaths, has of late years been wholly by those of recent foreign origin. This was the state of things existing in 1850; three years later it was evident that the births in that commonwealth, with the usual increase, had resulted in favor of foreign parents in an increased ratio. In other words, it is found that, in so far as depends upon the American and native element, and in the absence of the existing immigration from abroad, the population of our older States, even allowing for the loss by emigration, is stationary or decreasing.

The strange and otherwise unaccountable phenomenon to which we are now referring, appears to have been first elucidated in a memoir, upon the decrease of the rate of increase of population now obtaining in Europe and America, read by the same author in 1858 to the American Academy of Arts and Sciences, as a contribution to the science of political economy. That paper with all its mass of evidence, that as yet there seems to have been no attempt to controvert, we find embodied in the treatise to which I

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have referred, and which will prove of absorbing interest to even the casual reader.

Thus it is seen that abortion is a crime not merely against the life of the child, and the health of its mother, and against good morals, but that it strikes a blow at the very foundation of society itself.

One of the strange and unexpected results at which the author we have so often referred to has arrived, but which he has both proved to a demonstration and satisfactorily explained, is that abortions are infinitely more frequent among Protestant women than among Catholic; a fact, however, that becomes less unaccountable in view of the known size, comparatively so great, of the families of the latter—in the Irish, for instance—the point being that the different frequency of the abortions depends not upon a difference in social position or in fecundity, but in the religion. We should suppose *à priori* that the Protestant, especially if of New England and Puritan stock, would be much the safer against all such assaults of the world, the flesh, and the devil. The following is the concise and convincing solution of the paradox that has been given:—

"It is not, of course, intended to imply that Protestantism, as such, in any way encourages, or indeed permits, the practice of inducing abortion; its tenets are uncompromisingly hostile to all crime. So great, however, is the popular ignorance regarding this offence, that an abstract morality is here comparatively powerless; and there can be no doubt that the Romish ordinance, flanked on the one hand by the confessional, and by denouncement and excommunication on the other, has saved to the world thousands of infant lives."[1]

There is another surprising result that must strike every candid observer whose position gives him extended and frequent observation of women, and of late years the study and treatment of their special diseases has become so recognized that there are many physicians thus rendered competent to judge; it is this, but a second one of the many very frightful characteristics of induced abortion, that the act is proportionately much more common in the married than in the unmarried, basing the calculation upon an equal number of pregnancies in each case.

This fact also may be easily accounted for. Abortion is un-

[1] Essay on Criminal Abortion, p. 42.

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doubtedly more common in the earlier than in the later months of pregnancy, because the sensible signs of fœtal vitality are then less permanently present and the conscience is then better able to persuade itself that the child may possibly be without life or the alarm wholly a false one. It is less common with first than with subsequent children, though instances of its occurrence with the former are certainly not rare. A woman who has never been pregnant does not as a general rule conceive as readily as one who has already been impregnated before, perhaps partly from the fact that intercourse under certain circumstances is more likely to be excessive in such cases, at times producing acute or subacute inflammation of the cervix uteri and consequent sterility, as is so constantly observed in prostitutes, very many of whom upon ceasing their trade, after accumulating a little property, as in France, or upon being sent to outlying colonies, as in England, and becoming married, at once fall pregnant.

The unmarried woman, if enceinte, has not the opportunity of lying by for a few days' sickness without exciting suspicion, that the married can easily seize for themselves. She is often not so conversant with the early symptoms of gestation, and is more prone to wait until its existence has been rendered certain by the sensation of quickening, in the hope doubtless not unfrequently that this certainty may persuade her paramour to marriage, instead of deciding him against it, as is so often the case. It may be allowed, I think, that infanticide, the murder of a child after its birth, or its exposure to the vicissitudes and perils of chance, is more common among the unmarried, but that destruction of the fœtus in utero, the rather prevails where the rites of law and religion would seem to have extended to that fœtus every possible safeguard.

In the latest of the papers upon the subject of abortion, to which we have already alluded, there is furnished additional evidence as to the frequency of induced miscarriage.

"The infrequency of abortions," it is said, "as compared with labors at the full period is disproved by the experience of every physician in special or large general practice, who will faithfully investigate the subject. The truth of this statement has been fully verified in the instance of abortion criminally induced, by many of my professional friends who were at first inclined to doubt the accuracy of my inferences on that point; with reference to abortions more naturally occurring, the evidence is of course more easily arrived at and is in consequence proportionately more striking.

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In many cases of sterility it will be found that the number of abortions in a single patient have been almost innumerable; and, it may be added, in a large proportion of the cases of uterine disease occurring in the married, inquiry as to their past history will reveal abortions, unsuspected perhaps even by the family physician, as the cause. It is not so much the general practitioner, the hospital attendant, or the accoucheur as such, who can testify as to the true frequency of abortion; for many cases, even of the most deplorably fatal results, do not seek for medical assistance at the time of the accident. The real balance sheet of these cases is to be made out by the hands which are more especially called to the treatment of chronic uterine disease."[1]

But not only is abortion of excessively frequent occurrence. The nefarious practice is yearly extending, as does every vice that custom and habit have rendered familiar. It is foolish to trust that a change for the better may be spontaneously effected. "Longer silence and waiting by the profession would be criminal. If these wretched women, these married, lawful mothers, aye, and these Christian husbands, are thus murdering their children by thousands through ignorance, they must be taught the truth; but if, as there is reason to believe is too often the case, they have been influenced to do so by fashion, extravagance of living, or lust, no language of condemnation can be too strong."[2]

VI.—THE EXCUSES AND PRETEXTS THAT ARE GIVEN FOR THE ACT.

I have already stated that in many instances it is alleged by the mother that she is ignorant of the true character of the act of wilful abortion, and in some cases I am satisfied that the excuse is sincerely given; although in these days of the general diffusion of a certain amount of physiological knowledge, such ignorance would seem incredible.

The above is however the only excuse that can be given with any show of plausibility, and even this holds for naught should the case by any chance come under the cognizance of the law, just as would a plea of ignorance of the law itself; it being always taken for granted, that any intentional act implies a knowledge of its own nature and its consequences, be these trivial or grave.

[1] Studies of Abortion, etc.

[2] Essay on Criminal Abortion, p. 106.

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I have stated that in no case should abortion be permitted, or allowed to be permitted, by the advice or approval of a single physician; that in all cases where such counsel is taken, it should be from a consultation of at least two competent men. Submitted to such a tribunal, seldom indeed would the sanction be given.

Ill health would be no excuse, for there is hardly a conceivable case, where the invalidism could either not be relieved in some other mode, or where by an abortion it would not be made worse.

The fear of child-bed would be no excuse, for we have seen that its risks are in reality less than those of an abortion, and its pains and anguish can now be materially mitigated or entirely subdued by anæsthesia, which the skill of medical science can induce and should induce in every case of labor. My remarks apply not to first pregnancies alone, when one might expect that women would naturally be anxious and timid, but even to those cases of pregnancy that have been preceded by difficult and dangerous labors.

It has been urged, and not so absurdly as would at first sight appear, that the present possibilities of painless and so much safer delivery, by changing thus completely the primal curse, from anguish to a state frequently of positive pleasure, remove a drawback of actual advantage, and by offering too many inducements for pregnancy, tend to keep women in that state the greater part of their menstrual lives.[1]

Much of the low morale of the community, as regards the guilt of abortion, depends upon the very erroneous doctrines extensively inculcated by popular authors and lecturers for their own sinister purposes.

"One of these, is the doctrine that it is detrimental to a woman's health to bear children beyond a certain number, or oftener than at certain stated periods, and that any number of abortions are not merely excusable, as preventives, but advisable; it being entirely forgotten that frequency of connection may be kept within bounds, and the times of its occurrence regulated, by those who are not willing to hazard its consequences; that if women will, to escape trouble or for fashion's sake, forego the duty and privilege of nursing, a law entailed upon them by nature, and seldom neglected without disastrous results to their own constitutions, they must expect more frequent impregnation; that the habit of aborting is generally attended with the habit of more readily con-

[1] Essay on Criminal Abortion, p. 34.

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ceiving; and that abortions, accidental, and still more if induced, are generally attended by the loss of subsequent health, if not of life.

"This error is one which would justify abortion as necessary for the mother's own good; a selfish plea. The other is based on a more generous motive. It is that the fewer one's children, the more healthy they are likely to be, and the more worth to society. It is, however, equally fallacious with the first, and is without foundation in fact. The Spartans and Romans, so confidently appealed to, gave birth probably to as many weakly children as do our own women; that they destroyed many for this reason in infancy, is notorious. The brawny Highlanders are not the only offspring of their parents; the others cannot endure the national processes of hardening by exposure and diet, and so die young from natural causes. But were this theory true even so far as it goes, the world, our own country, could ill spare its frailer children, who oftenest, perhaps, represent its intellect and its genius."[1]

VII.—ALTERNATIVES, PUBLIC AND PRIVATE, AND MEASURES OF RELIEF.

It may be asked if there is no latitude to be allowed for extreme cases of the character already described; we are compelled to answer, none. If each woman were allowed to judge for herself in this matter, her decision upon the abstract question would be too sure to be warped by personal considerations, and those of the moment. Woman's mind is prone to depression, and, indeed, to temporary actual derangement, under the stimulus of uterine excitation, and this alike at the time of puberty and the final cessation of the menses, at the monthly period and at conception, during pregnancy, at labor and during lactation; a matter that also seems to have been more thoroughly investigated by the authority I have so freely drawn from in reference to the question of abortion, than by any other writer in this country.[2] During the state of gestation the woman is therefore liable to thoughts, convictions even, that at other times she would turn from in disgust or dismay; and in this fact, that must be as familiar to herself as it is to the physician, we find her most valid excuse for the crime.

[1] Essay on Criminal Abortion, p. 32.

[2] H. R. Storer: The Causation, Course, and Treatment of Insanity in Women; a gynæcist's idea thereof; Transactions of the American Medical Association, vol. xvi., 1865.

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Is there then no alternative but for women, when married and prone to conception, to occasionally bear children? This, as we have seen, is the end for which they are physiologically constituted and for which they are destined by nature. In it lies their most efficient safeguard for length of days and immunity from disease. Intentionally to prevent the occurrence of pregnancy, otherwise than by total abstinence from coition, intentionally to bring it, when begun, to a premature close, are alike disastrous to a woman's mental, moral, and physical well-being.

There are various alternatives to these so degrading habits of the community. To some of them equal objections apply. But, in reality, there is little difference between the immorality by which a man forsakes his home for an occasional visit to a house of prostitution, that he may preserve his wife from the chance of pregnancy, and the immorality by which that wife brings herself wilfully to destroy the living fruit of her womb. Allowing for the weakness and frailty of human nature, the first were surely the preferable of the twain. But we need not compare these odious customs, each so common and each so wrong. With greater frugality of living, and greater self-denial, and self-control in more trivial matters, there need be no interference, at least no intentional interference, on the part of either husband or wife with the first great law of human weal and human happiness, in accordance with which, by the divine institution of home and its mutual joys, the due propagation and natural increase of the species was intended to be insured.

Were well-arranged foundling hospitals provided in all our large cities, they would prove a most efficient means of preventing the sacrifice of hundreds of the children of shame, and, so far from encouraging immorality, they would afford one of its surest preventives, for by keeping a woman from the crime of infanticide or the equally guilty intentional miscarriage, they would save her from one element of the self-condemnation and hatred which so often hurries the victim of seduction downward to the life of the brothel. A certain amount of illicit intercourse between the sexes will always take place, no matter how condemned by law, until the public standard of morals shall be so elevated as to render the practice unknown. This is a fact that is self-evident, and cannot be frowned out of existence. How much better to provide for its innocent victims, its irresponsible offspring, than, as now, to permit the so frequent destruction of both. It is foolish to assert that by such provision we but pander to sin. In many of these instances

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the woman is innocent of intentional wrong, being led astray by her perfect confidence in the constancy and good faith of a lover, and in others she is, doubtless, ignorant of the true character of the act she is committing. Should she be driven from what is comparatively a venial, and not so unnatural an offence, to one of the deadliest crimes?

But for the married, who have not this strong stimulus of necessity, and the excuse of having been led astray or deceived, there need be no public channel provided, through which to purchase safety for their children. Is it not, indeed, inconceivable that the very women who, when their darlings of a month old, or a year, are snatched from them by disease, find the parting attended with so acute a pang, can so deliberately provide for and congratulate themselves, and each other, upon a wilful abortion? Here, words fail us.

"Of the mother, by consent or by her own hand, imbrued with her infant's blood; of the equally guilty father, who counsels or allows the crime; of the wretches, who by their wholesale murders far out-herod Burke and Hare; of the public sentiment which palliates, pardons, and would even praise this, so common, violation of all law, human and divine, of all instinct, all reason, all pity, all mercy, all love, we leave those to speak who can."[1]

VIII.—RECAPITULATION.

We have now seen that the induction of a forced abortion is, in reality, a crime against the infant, its mother, the family circle, and society; that it is attended with extreme danger, whether immediate or remote, to the mother's happiness, to her health, mental and physical, and to her life; that there is, in reality, no valid excuse for it that can be urged, save when it has been decided to be an absolute necessity by two competent medical men, and that there are alternatives, such as greater temperance and frugality of living, which, if practised, would be equally for the public and for private good.

We have also seen that not only is abortion wrong, no matter from what quarter we contemplate the act, but so also is the deliberate prevention of pregnancy in the married alike detrimental to the health and to the moral sense. Moderation and temperance

[1] Essay on Criminal Abortion, p. 13.

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here, as elsewhere, afford the golden rule. Under the circumstances to which I allude, total abstinence may, as far as the health is concerned, be as injurious as is the other extreme of excessive indulgence. To the woman in good bodily condition, occasional child-bearing is an important means of healthful self-preservation; to the invalid, an intentional miscarriage is no means of cure; if she be in poor health, let her seek aid and relief in the proper quarter, but not by thus tampering with natural and physiological laws, alike imperilling both body and soul.

Were woman intended as a mere plaything, or for the gratification of her own or her husband's desires, there would have been need for her of neither uterus nor ovaries, nor would the prevention of their being used for their clearly legitimate purpose have been attended by such tremendous penalties as is in reality the case.

We have seen that in a perverted and mistaken public opinion lies the secret of the whole matter. "Ladies boast to each other of the impunity with which they have aborted, as they do of their expenditures, of their dress, of their success in society. There is a fashion in this, as in all other female customs, good and bad. The wretch whose account with the Almighty is heaviest with guilt, too often becomes a heroine. So truly is this the case, that the woman who dares at the present day publicly or privately to acknowledge it the holiest duty of her sex to bring forth living children, 'that first, highest, and in earlier times almost universal lot,'[1] is worthy, and should receive, the highest admiration and praise."[2]

We have seen that it is no trifling matter, this awful waste of human life. It is a subject that demands the best efforts of the whole medical profession, both as a body and as men, whose every relation its members are alike best able to appreciate, to understand, and to advise concerning. "Physicians alone," says Prof. Hodge, "can rectify public opinion, they alone can present the subject in such a manner that legislators can exercise their powers aright in the preparation of suitable laws; that moralists and theologians can be furnished with facts to enforce the truth upon the moral sense of the community, so that not only may the crime of infanticide be abolished, but criminal abortion properly reprehended; and that women in every rank and condition of life may

[1] A Woman's Thoughts about Women. By the author of "John Halifax, Gentleman," p. 14.

[2] Dr. Storer's Essay, p. 55.

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be made sensible of the value of the fœtus, and of the high responsibility which rests upon its parents."[1]

"If the community were made to understand and to feel that marriage, where the parties shrink from its highest responsibilities, is nothing less than legalized prostitution, many would shrink from their present public confession of cowardly, selfish, and sinful lust. If they were taught by the speech and daily practice of their medical attendants, that a value attaches to the unborn child, hardly increased by the accident of its birth, they also would be persuaded or compelled to a similar belief in its sanctity, and to a commensurate respect."[2]

We have seen that the above is the deliberate decision of those, from their observation and knowledge of the subject best able to judge. "Whatever estimate may attach to our opinion," says an eminent medical journalist, "we believe that not only ought these things not so to be, but that the public should know it from good authority. For ourselves, we have no fear that the truth in reference to the crime of procuring abortion would do aught but good. It would appear that sheer ignorance, in many honest people, is the spring of the horrible intra-uterine murder which exists among us; why not then enlighten this ignorance? It would be far more effectually done by some bold and manly appeal, than by the scattered influence of honorable practitioners alone. Will not the mischief, by and by, be all the more deadly, for delaying exposure and attempting relief?"[3]

We have also seen that "it might be, it very likely would be, for our immediate pecuniary interest, as a profession, to preserve silence; for we have shown that abortions, of all causes, tend to break down and ruin the health of the community at large. But to harbor this thought, even for a moment, were dishonorable."[4]

This subject, at all times so important for the consideration of the people at large, is invested with unusual interest at a period like the present, when, at the close of a long and closely contested war, greater fields for human development and success are opened than ever before. All the fruitfulness of the present generation, tasked to its utmost, can hardly fill the gaps in our population that have

[1] Introductory Lecture at University of Pennsylvania, 1854, p. 19.
[2] Essay, etc., p. 101.
[3] Boston Medical and Surgical Journal, editorial, December 13, 1855.
[4] Essay, etc., p. 106.

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of late been made by disease and the sword, while the great territories of the far West just opening to civilization, and the fertile savannas of the South now disenthralled and first made habitable by freemen, offer homes for countless millions yet unborn. Shall they be filled by our own children or by those of aliens? This is a question that our own women must answer; upon their loins depends the future destiny of the nation.

In the hope that the present appeal may do somewhat to stem the tide of fashion and depraved public opinion; that it may tend to persuade our women that forced abortions are alike unchristian, immoral, and physically detrimental; that it may dissipate the ignorance concerning the existence of fœtal life that so extensively prevails; and be the means of promoting the ratio of increase of our national population so unnaturally kept down, the American Medical Association addresses itself to all American mothers; for thus, in the closing words of the essay from which I have so frequently and so freely drawn, would "the profession again be true to its mighty and responsible office of shutting the great gates of human death."

The following resolution, presented by Dr. Ellsworth Eliott, of New York, was adopted by the Association at the recommendation of the Section on Practical Medicine and Obstetrics.

"*Resolved*, That the Committee on Publication be requested to adopt such appropriate measures as will insure a speedy and general circulation of the Prize Essay on Abortion, provided this can be done without expense to the Association."

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REPORT

OF THE

COMMITTEE APPOINTED TO REVISE THE PLAN OF ORGANIZATION, ETC.

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REPORT OF THE COMMITTEE APPOINTED TO REVISE THE PLAN OF ORGANIZATION, ETC.

At the annual meeting of the Association in New York, June 9th, 1864, the following resolution was adopted:—

"Resolved, that a committee of three be appointed to collate and revise the plan of organization, putting into an orderly code all ordinances now in force, but not adding any new matter, except to harmonize the several parts." (See *Trans.*, vol. xv. p. 51.)

At the meeting of the Association held in the city of Washington, the following resolution was adopted:—

"Resolved, that the Committee of Publication be instructed to collect all the by-laws and resolutions which have not been rescinded through the different volumes of the *Transactions*, to arrange them under their respective heads, and append the same to the Constitution."

The Committee of Publication, in complying with this resolution, collected together the various unrepealed rules and resolutions relating to the business of the Association which had been adopted from year to year, but instead of arranging them under appropriate heads and *appending* them to the Constitution, they incorporated them directly *into* the Constitution.

Thence, in all the volumes of the *Transactions* since that year, we find published, under the title of "Plan of Organization," such provisions of the Constitution as remain unrepealed, so intermingled with by-laws and resolutions adopted from time to time, that no reader can determine which are actual constitutional provisions, and which mere by-laws, without carefully searching the records of all the past volumes of the *Transactions*. As the first have all the force of organic law, to be changed only by notice of one year and a vote of three-fourths of all the members in attendance at the meeting, while the latter are mere by-laws or resolutions, at all times changeable at the pleasure of a majority, it is of much importance that they should be carefully separated, and the distinction clearly indicated in all our future publications.

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With this view, your Committee have carefully examined the record of the proceedings of the Association, from its organization to the present time, and compared the several amendments to the Constitution, adopted from time to time, with the original, and have endeavored to incorporate them into the text in such a way as to clearly express the objects designed in their adoption. By a similar examination, all the rules and resolutions found on the records, pertaining to the mode of transacting business; or to methods of carrying out constitutional provisions; or giving authoritative constructions to the same; and therefore possessing the nature of *by-laws*, have been collected and arranged under appropriate heads, with the general designation of *By-laws*. Whenever rules or resolutions have been found to conflict with each other, your Committee have acted on the assumption that the one last adopted repealed the other, and have, therefore, omitted the latter from the revised list.

Of course, all such resolutions as have been adopted from time to time and published in the record of the proceedings, which contain simple declarations of opinion concerning topics then under discussion, or express rules of action relating only to the meeting then in session, have been omitted from the work of your Committee.

The amendments to the Constitution, adopted at the meeting in Charleston in 1851, and still more, those adopted in New York in 1864, make several alterations in the "order of business" indispensable to the proper management of the business of the Association.

For instance, prominent in the present "order of business" stands the "reading and consideration of the stated annual reports from the standing committees;" while the amendments to the Constitution, adopted in 1851, abolished all these *standing committees*, except those of Publication and Arrangements. The by-laws adopted from time to time have brought into existence a large number of *special committees* to report each year, but there is no proper provision in the present "order of business" for the reception of such reports, except constructively under the order of "unfinished and miscellaneous business." Again, the amendment to the Constitution adopted unanimously by the meeting of the Association in 1864, directs that the President and Vice-President shall assume the functions of their respective offices at the beginning of the annual meeting next succeeding their election, while the present "order of business" contemplates a "*temporary organization*"

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at the opening of each meeting, and the election of officers who are to commence their duties immediately after their election.

Owing to these facts, your Committee have deemed it proper to include in their report such a revised "Order of Business" as will harmonize it with the Constitution and By-laws now in force.

In all the later volumes of the *Transactions* of the Association, the preamble to the Constitution has been omitted. Inasmuch as such preamble contains both the date and origin of the instrument, together with a specific declaration of the objects for which it was adopted, your Committee deem it of much importance that it should be permanently retained as a part of the original "Plan of Organization." In accordance with the foregoing views, your Committee respectfully submit the following revised Plan of Organization, By-laws, and Order of Business.

N. S. DAVIS,
JAS. H. HIBBERD.

PLAN OF ORGANIZATION FOR A NATIONAL MEDICAL ASSOCIATION.

Whereas, The Medical Convention, held in the city of New York, in May, 1846, have declared it expedient "for the medical profession of the United States to institute a National Medical Association;" and,

Inasmuch as an institution so conducted as to give frequent, united, and emphatic expression to the views and aims of the medical profession in this country, must, at all times, have a beneficial influence, and supply more efficient means than have hitherto been available here for cultivating and advancing medical knowledge; for elevating the standard of medical education; for promoting the usefulness, honor, and interests of the medical profession; for enlightening and directing public opinion in regard to the duties, responsibilities, and requirements of medical men; for exciting and encouraging emulation and concert of action in the profession, and for facilitating and fostering friendly intercourse between those who are engaged in it; therefore,

Be it resolved, In behalf of the medical profession of the United States—that the members of the Medical Convention, held in Philadelphia, in May, 1847, and all others who, in pursuit of the objects above mentioned, are to unite with, or succeed them, constitute a National Medical Association; and that, for the organization and management of the same, they adopt the following *Regulations*.

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I.—TITLE OF THE ASSOCIATION.

This institution shall be known and distinguished by the name and title of "The American Medical Association."

II.—MEMBERS.

The members of this institution shall collectively represent and have cognizance of the common interests of the medical profession in every part of the United States; and shall hold their appointment to membership either as delegates from local institutions, as members by invitation, or as permanent members.

The *Delegates* shall receive their appointment from permanently organized medical societies, medical colleges, hospitals, lunatic asylums, and other permanently organized medical institutions of good standing in the United States, and from the American Medical Society of Paris.

Each delegate shall hold his appointment for one year, and until another is appointed to succeed him, and shall participate in all the business and affairs of the Association.

Each local society shall have the privilege of sending to the Association one delegate for every ten of its regular resident members, and one for every additional fraction of more than half this number. The faculty of every regularly constituted medical college or chartered school of medicine shall have the privilege of sending two delegates. The professional staff of every chartered or municipal hospital, containing a hundred inmates or more, shall have the privilege of sending two delegates; and every other permanently organized medical institution of good standing shall have the privilege of sending one delegate.

No individual who shall be under sentence of expulsion or suspension from any State or local medical society of which he may have been a member, shall be received as a delegate to this Association, or be allowed any of the privileges of a member, until he shall have been relieved from the said sentence by such State or local society.

No one expelled from this Association shall at any time thereafter be received as a delegate or member, unless by a three-fourths vote of the members present at the meeting to which he is sent, or at which he is proposed.

Members by Invitation shall consist of practitioners of reputable standing from sections of the United States not otherwise repre-

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sented at the meeting. They shall receive their appointment by invitation of the meeting, after an introduction from, and being vouched for by, any of the members present, or any of the absent permanent members. They shall hold their connection with the Association until the close of the annual session at which they are received; and shall be entitled to participate in all its affairs, as in the case of delegates.

The *Permanent Members* shall consist of all those who have served in the capacity of delegates, and of such other members as may receive the appointment by unanimous vote. Permanent members shall at all times be entitled to attend the meetings, and participate in the affairs of the Association, so long as they shall continue to conform to its regulations, but without the right of voting; and, when not in attendance, they shall be authorized to grant letters of introduction to reputable practitioners of medicine residing in their vicinity, who may wish to participate in the business of the meeting, as provided for members by invitation.

Every member elect, prior to the permanent organization of the annual meeting, or before voting on any question after the meeting has been organized, must sign these regulations, inscribing his name and address in full, specifying in what capacity he attends, and, if a delegate, the title of the institution from which he has received his appointment.

III.—MEETINGS.

The regular meetings of the Association shall be held annually, and commence on the first Tuesday in May or first Tuesday in June. The place of meeting shall never be the same for any two years in succession, and shall be determined, with the time of meeting for each next successive year, by vote of the Association.

IV.—OFFICERS.

The officers of the Association shall be a President, four Vice-Presidents, one Permanent and one Assistant Secretary, and a Treasurer. They shall be nominated by a special committee of one member from each State represented at the meeting, and shall be elected by vote on a general ticket.

Each officer, except the Permanent Secretary, shall hold his appointment for one year, and until another is elected to succeed him. The Permanent Secretary shall hold his appointment until

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removed by death, resignation, or a vote of two-thirds of the members present at a regular annual meeting.

The President and Vice-Presidents shall assume the functions of their respective offices at the beginning of the annual meeting next succeeding their election; all other officers shall enter upon their duties immediately after their election.

The President shall preside at the meetings, preserve order and decorum in debate, give a casting vote when necessary, and perform all the other duties that custom and parliamentary usage may require.

The Vice-Presidents, when called upon, shall assist the President in the performance of his duties, and during the absence, or at the request of the President, one of them shall officiate in his place.

The Permanent Secretary shall record the minutes and authenticate the proceedings; give due notice of the time and place of each next ensuing annual meeting; notify all members of committees of their appointment, and of the duties assigned to them; hold correspondence with other permanently organized medical societies, both domestic and foreign; serve as a member of the Committee of Publication; see that the published *Transactions* are promptly distributed to all the members who have paid the annual assessment, and carefully preserve the archives and unpublished transactions of the Association.

The Assistant Secretary shall aid the Permanent Secretary in recording and authenticating the proceedings of the Association; serve as a member of the Committee of Arrangements, and perform all the duties of Permanent Secretary temporarily, whenever that office shall be vacant, either by death, resignation, or removal.

The Treasurer shall have the immediate charge and management of the funds and property of the Association. He shall be a member of the Committee of Publication, to which committee he shall give bonds for the safe keeping and proper use and disposal of his trust. And through the same committee he shall present his accounts, duly authenticated, at every regular meeting.

V.—STANDING COMMITTEES.

The following standing committees, each composed of seven members, shall be organized at every annual meeting, for preparing, arranging, and expediting business for each next ensuing year, and for carrying into effect the orders of the Association not

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otherwise assigned, namely, a Committee of Arrangements and a Committee of Publication.

The Committee of Arrangements shall, if no sufficient reasons prevent, be mainly composed of seven members residing in the place at which the Association is to hold its next annual meeting; and shall be required to provide suitable accommodations for the meeting, to verify and report upon the credentials of membership, to receive and announce all essays and memoirs voluntarily communicated, either by members of the Association, or by others through them, and to determine the order in which such papers are to be read and considered.

The Committee of Publication, of which the Secretaries and Treasurer must constitute a part, shall have charge of preparing for the press, and of publishing and distributing such of the proceedings, transactions, and memoirs of the Association as may be ordered to be published. The six members of this Committee, who have not the immediate management of the funds, shall also in their own names as agents for the Association, hold the bond of the Treasurer for the faithful execution of his office, and shall annually audit and authenticate his accounts, and present a statement of the same in the annual report of the Committee; which report shall specify the character and cost of the publications of the Association during the year, the number of copies still at the disposal of the meeting, the funds on hand for further operations, and the probable amount of the assessment to be laid on each member of the Association for covering its annual expenditures.

VI.—FUNDS AND APPROPRIATIONS.

Funds shall be raised by the Association for meeting its current expenses and awards from year to year, but never with the view of creating a permanent income from investments. Funds may be obtained by an equal assessment of not more than three dollars annually, on each of the members; by individual voluntary contributions for specific objects; and by the sale and disposal of publications, or of works prepared for publication.

The funds may be appropriated for defraying the expenses of the annual meetings, including the necessary expenses of the Permanent Secretary in maintaining the necessary correspondence of the Association; for publishing the proceedings, memoirs, and transactions of the Association; for enabling the Standing Com-

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mittees to fulfil their respective duties, conduct their correspondence, and procure the materials necessary for the completion of their stated annual reports; for the encouragement of scientific investigation by prizes and awards of merit; and for defraying the expenses incidental to specific investigations under the instruction of the Association, where such investigations have been accompanied with an order on the Treasurer to supply the funds necessary for carrying them into effect.

VII.—PROVISION FOR AMENDMENT.

No amendment or alteration shall be made in any of these articles, except at the annual meeting next subsequent to that at which such amendment or alteration may have been proposed; and then only by the voice of three-fourths of all the members in attendance.

And, in acknowledgment of having adopted the foregoing propositions, and of our willingness to abide by them, and use our endeavors to carry into effect the objects of this Association as above set forth, we have hereunto affixed our names.

NAMES OF MEMBERS.	RESIDENCE.	INSTITUTION REPRESENTED.

BY-LAWS.

I.—ORDER OF BUSINESS.

The order of business at the annual meetings of the American Medical Association shall at all times be subject to the vote of three-fourths of all the members in attendance; and, until permanently altered, except when for a time suspended, it shall be as follows, viz:—

1st. The calling of the meeting to order by the President elected the preceding year, or, in his absence, by one of the Vice-Presidents.

2d. The report of the Committee of Arrangements on the credentials of members, after the latter have registered their names and addresses, and the titles of the institutions which they represent.

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3d. The reception of members by invitation.

4th. The election of permanent members.

5th. The reading of notes from absentees.

6th. The hearing of the annual address of the President.

7th. The reception of the reports of all special committees and voluntary communications, and their reference to the appropriate Sections.

8th. The appointment of the committee of one from each State represented, to nominate officers of the Association, and to fill the standing committees.

9th. The reading and consideration of the reports of the Standing Committees of Publication; on Medical Education; on Medical Literature; and on Prize Essays.

10th. Resolutions introducing new business, and instructions to the permanent committees.

11th. The selection of the next place of meeting.

12th. The report of the Nominating Committee, and the election of officers of the Association.

13th. Reports from the several Sections.

14th. Reading of the minutes by the Secretary.

15th. Unfinished and miscellaneous business.

16th. Adjournment.

II.—SECTIONS.

The general meetings of the Association shall be restricted to the morning sessions; and the afternoon sessions, commencing at three o'clock, shall be devoted to the hearing of reports and papers, and their consideration, in the following *Sections*:—

1. (Anatomy and Physiology.[1])
2. Chemistry and Materia Medica.
3. Practical Medicine and Obstetrics.
4. Surgery.
5. Meteorology, Medical Topography, and Epidemic Diseases.
6. Medical Jurisprudence and Hygiene.
7. Psychology.[2]

Each Section shall choose its own officers, and make its own rules of order.

[1] Section 1 abolished; Anatomy added to Surgery; and Physiology to Medical Jurisprudence and Hygiene. See minutes, p. 41.

[2] Added by resolution at Boston. See p. 41.

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All essays, voluntary communications, and reports, except those of the officers of the Association, and those of the Committees of Publication, on Medical Education, Medical Literature, and Prize Essays, shall first be presented to the Association by a brief abstract, and referred to the appropriate Sections, in which they shall be examined and discussed, after which they shall be returned to the Permanent Secretary of the Association, accompanied by an expression of opinion as to whether they are worthy of publication or not. And the Secretary shall pass all such as are thus designated to be worthy, directly to the Committee of Publication; and such as are not so designated shall be retained by the Secretary, or returned to their authors, as the latter may indicate.

III.—STANDING COMMITTEES.

The following are the Standing Committees of the Association, to be filled by the Committee on Nominations, and to report at the next annual meeting subsequent to their appointment, viz: Committee of Arrangements; Committee of Publication; Committee on Prize Essays; Committee on Medical Education; Committee on Medical Literature; Committee on Climatology and Epidemic Diseases; and Committee on American Medical Necrology.

The *Committee of Publication* shall append to each volume of the *Transactions* hereafter published, a copy of the Constitution, By-Laws, and Code of Ethics of the Association. It shall print conspicuously, at the beginning of each volume of the *Transactions*, the following disclaimer, viz: "The American Medical Association, although formally accepting and publishing the reports of the various standing committees, holds itself wholly irresponsible for the opinions, theories, or criticisms therein contained, except when otherwise decided by special resolution." It shall be the duty of the same Committee to fix the price at which the printed *Transactions* of each session will be furnished to others than delegates and members; provided that in no case shall the said price be less than three dollars. And it shall have power to furnish the chairmen of committees on epidemics with extra copies of their reports, respectively, at the expense of the Association—the said extra copies not to exceed one hundred.

The *Committee on Prize Essays* shall consist of five members, residing in the same neighborhood, whose duty it shall be, in the interval

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between the present and the next succeeding annual sessions, to receive papers upon any subject, from any persons who may choose to send them; to decide upon the merits of these papers, and to select for presentation to the Association, at its next session, such as they may deem worthy of being thus presented. The Committee shall have power to form such regulations as to the mode in which the papers are to be presented, and as to the observing of secrecy, as they may think proper; and also to award two prizes of one hundred dollars each, to the best two volunteer communications reported on favorably by them, and directed by the Association to be published.

The *Committees on Medical Education* and *Medical Literature* shall consist of five members each, to be appointed annually.

The *Committee on Climatology* and *Epidemic Diseases* shall consist of one member for each State and Territory represented in the Association, whose duty it shall be to report upon its medical topography, epidemic diseases, and the most successful treatment thereof, and that the same shall continue to hold their office for three years.

The *Committee on American Medical Necrology* shall consist of one member for each State represented in the Association, whose duty it shall be to procure memorials of the eminent and worthy dead among the distinguished physicians of our country, and present them to this Association for publication in their *Transactions*.

IV.—THE PUBLICATION OF PAPERS AND REPORTS.

No report or other paper shall be entitled to publication in the volume for the year in which it shall be presented to the Association, unless it be placed in the hands of the Committee of Publication on or before the first day of July. It must also be so prepared as to require no material alteration or addition at the hands of its author.

Authors of papers are required to return their proofs within two weeks after their reception; otherwise they will be passed over and omitted from the volume.

Every paper received by this Association and ordered to be published, and all plates or other means of illustration, shall be considered the exclusive property of the Association, and shall be published and sold for the exclusive benefit of the Association.

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V.—ASSESSMENTS.

The sum of three dollars shall be assessed, annually, upon each delegate to the sessions of the Association, as well as upon each of its permanent members, for the purpose of raising a fund to defray the expenses of printing the *Transactions*. The payment of this assessment shall be required of the delegates and members in attendance upon the sessions of the Association previously to their taking their seats and participating in the business of the session. Each delegate and member who has paid his annual assessment, shall be entitled to receive a copy of the printed *Transactions* of the session.

No assessment shall be made upon *members by invitation*, or upon permanent members not present at the annual meeting. But all members of either class who shall pay to the Treasurer a sum not less than the annual assessment paid by delegates and members in attendance, shall also be entitled to a copy of the printed *Transactions* for the year in which such payment is made.

VI.—DELEGATES FROM THE MEDICAL STAFFS OF THE ARMY AND NAVY.

Delegates representing the medical staffs of the United States Army and Navy, shall be appointed by the Chiefs of the Army and Navy Medical Bureaus. The number of delegates so appointed shall be four from the army medical officers, and an equal number from the navy medical officers.

VII.—DELEGATES TO FOREIGN MEDICAL SOCIETIES.

The President shall be authorized annually to appoint delegates to represent this Association at the meetings of the British Association, the American Medical Society at Paris, and such other scientific bodies in Europe as may be affiliated with us.

VIII.—DUTIES OF MEMBERS.

No one shall be permitted to address the Association, except he shall have first given his name and residence, which shall be distinctly announced from the chair, and the member may be required to go forward and speak from the stand, but not more than ten minutes at one time.

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No one appointed on a special committee, who fails to report at the meeting next succeeding the one at which he is appointed, shall be continued on such committee, or appointed on any other, unless a satisfactory excuse is offered.

It shall be the duty of every member of this Association, who learns that any existing medical school departs from the published conditions of graduation, to report the fact at the annual meetings; and, on proof of the fact, such school shall be deprived of its representation in this body.

IX.—CONDITIONS EXCLUDING REPRESENTATION.

No State or Local Medical Society, or other organized institution, shall be entitled to representation in this Association that has not adopted its Code of Ethics; or that has intentionally violated or disregarded any article or clause of the same.

This Association recognizes as a "regular organized" medical college, one that has been represented at any meeting, and that complies with the rules and directions found in the published *Transactions*, vol. xiii. page 33.

ORDINANCES.

Resolved, That the several Sections of this Association be requested, in the future, to refer no papers or reports to the Committee of Publication, except such as can be fairly classed under one of the three following heads, viz: 1st. Such as may contain and establish *positively* new facts, modes of practice, or principles of real value. 2d. Such as may contain the results of well-devised original experimental researches. 3d. Such as present so complete a review of the facts on any particular subject as to enable the writer to deduce therefrom legitimate conclusions of importance.

Resolved, That the several sections be requested, in the future, to refer all such papers as may be presented to them for examination by this Association, that contain matter of more or less value, and yet cannot be fairly ranked under either of the heads mentioned in the foregoing resolution, back to their authors with the recommendation that they be published in such regular medical periodi-

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cals as said authors may select, with the privilege of placing at the head of such papers, "Read to the Section of the American Medical Association on the day of 18 ." (Vide *Transactions*, vol. xvi. p. 40.)

Resolved, That the Association shall send annually a delegate to the "Association of Medical Superintendents of Insane Asylums," one of whose duties it shall be to urge upon that Association the advantage, for all purposes of science, of a more intimate union with this Association. (Vide *Transactions*, vol. xvi. p. 41.)

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CODE OF ETHICS

OF THE

AMERICAN MEDICAL ASSOCIATION,

ADOPTED MAY, 1847.

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CODE OF MEDICAL ETHICS.

OF THE DUTIES OF PHYSICIANS TO THEIR PATIENTS AND OF THE OBLIGATIONS OF PATIENTS TO THEIR PHYSICIANS.

ART. I.—*Duties of physicians to their patients.*

§ 1. A physician should not only be ever ready to obey the calls of the sick, but his mind ought also to be imbued with the greatness of his mission, and the responsibility he habitually incurs in its discharge. These obligations are the more deep and enduring, because there is no tribunal other than his own conscience to adjudge penalties for carelessness or neglect. Physicians should, therefore, minister to the sick with due impressions of the importance of their office; reflecting that the ease, the health, and the lives of those committed to their charge, depend on their skill, attention, and fidelity. They should study, also, in their deportment, so to unite *tenderness* with *firmness*, and *condescension* with *authority*, as to inspire the minds of their patients with gratitude, respect, and confidence.

§ 2. Every case committed to the charge of a physician should be treated with attention, steadiness, and humanity. Reasonable indulgence should be granted to the mental imbecility and caprices of the sick. Secrecy and delicacy, when required by peculiar circumstances, should be strictly observed; and the familiar and confidential intercourse to which physicians are admitted in their professional visits, should be used with discretion, and with the most scrupulous regard to fidelity and honor. The obligation of secrecy extends beyond the period of professional services;—none of the privacies of personal and domestic life, no infirmity of disposition or flaw of character observed during professional attendance, should ever be divulged by the physician except when he is imperatively required to do so. The force and necessity of this obligation

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are indeed so great, that professional men have, under certain circumstances, been protected in their observance of secrecy by courts of justice.

§ 3. Frequent visits to the sick are in general requisite, since they enable the physician to arrive at a more perfect knowledge of the disease—to meet promptly every change which may occur and also tend to preserve the confidence of the patient. But unnecessary visits are to be avoided, as they give useless anxiety to the patient, tend to diminish the authority of the physician, and render him liable to be suspected of interested motives.

§ 4. A physician should not be forward to make gloomy prognostications, because they savor of empiricism, by magnifying the importance of his services in the treatment or cure of the disease. But he should not fail, on proper occasions, to give to the friends of the patient timely notice of danger when it really occurs; and even to the patient himself, if absolutely necessary. This office, however, is so peculiarly alarming when executed by him, that it ought to be declined whenever it can be assigned to any other person of sufficient judgment and delicacy. For, the physician should be the minister of hope and comfort to the sick; that, by such cordials to the drooping spirit, he may smooth the bed of death, revive expiring life, and counteract the depressing influence of those maladies which often disturb the tranquillity of the most resigned in their last moments. The life of a sick person can be shortened not only by the acts, but also by the words or the manner of a physician. It is, therefore, a sacred duty to guard himself carefully in this respect, and to avoid all things which have a tendency to discourage the patient and to depress his spirits.

§ 5. A physician ought not to abandon a patient because the case is deemed incurable; for his attendance may continue to be highly useful to the patient, and comforting to the relatives around him, even in the last period of a fatal malady, by alleviating pain and other symptoms, and by soothing mental anguish. To decline attendance, under such circumstances, would be sacrificing to fanciful delicacy and mistaken liberality, that moral duty, which is independent of, and far superior to, all pecuniary consideration.

§ 6. Consultations should be promoted in difficult or protracted cases, as they give rise to confidence, energy, and more enlarged views in practice.

§ 7. The opportunity which a physician not unfrequently enjoys of promoting and strengthening the good resolutions of his patients,

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suffering under the consequences of vicious conduct, ought never to be neglected. His counsels, or even remonstrances, will give satisfaction, not offence, if they be proffered with politeness, and evince a genuine love of virtue, accompanied by a sincere interest in the welfare of the person to whom they are addressed.

ART. II.—*Obligations of patients to their physicians.*

§ 1. The members of the medical profession, upon whom is enjoined the performance of so many important and arduous duties towards the community, and who are required to make so many sacrifices of comfort, ease, and health, for the welfare of those who avail themselves of their services, certainly have a right to expect and require, that their patients should entertain a just sense of the duties which they owe to their medical attendants.

§ 2. The first duty of a patient is to select as his medical adviser one who has received a regular professional education. In no trade or occupation, do mankind rely on the skill of an untaught artist; and in medicine, confessedly the most difficult and intricate of the sciences, the world ought not to suppose that knowledge is intuitive.

§ 3. Patients should prefer a physician whose habits of life are regular, and who is not devoted to company, pleasure, or to any pursuit incompatible with his professional obligations. A patient should, also, confide the care of himself and family, as much as possible, to one physician; for a medical man who has become acquainted with the peculiarities of constitution, habits, and predispositions of those he attends, is more likely to be successful in his treatment than one who does not possess that knowledge.

A patient who has thus selected his physician should always apply for advice in what may appear to him trivial cases, for the most fatal results often supervene on the slightest accidents. It is of still more importance that he should apply for assistance in the forming stage of violent diseases; it is to a neglect of this precept that medicine owes much of the uncertainty and imperfection with which it has been reproached.

§ 4. Patients should faithfully and unreservedly communicate to their physician the supposed cause of their disease. This is the more important, as many diseases of a mental origin simulate those depending on external causes, and yet are only to be cured by ministering to the mind diseased. A patient should never be afraid of thus making his physician his friend and adviser; he should

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always bear in mind that a medical man is under the strongest obligations of secrecy. Even the female sex should never allow feelings of shame or delicacy to prevent their disclosing the seat, symptoms, and causes of complaints peculiar to them. However commendable a modest reserve may be in the common occurrences of life, its strict observance in medicine is often attended with the most serious consequences, and a patient may sink under a painful and loathsome disease which might have been readily prevented had timely intimation been given to the physician.

§ 5. A patient should never weary his physician with a tedious detail of events or matters not appertaining to his disease. Even as relates to his actual symptoms, he will convey much more real information by giving clear answers to interrogatories, than by the most minute account of his own framing. Neither should he obtrude upon his physician the details of his business nor the history of his family concerns.

§ 6. The obedience of a patient to the prescriptions of his physician should be prompt and implicit. He should never permit his own crude opinions as to their fitness to influence his attention to them. A failure in one particular may render an otherwise judicious treatment dangerous, and even fatal. This remark is equally applicable to diet, drink, and exercise. As patients become convalescent, they are very apt to suppose that the rules prescribed for them may be disregarded, and the consequence, but too often, is a relapse. Patients should never allow themselves to be persuaded to take any medicine whatever, that may be recommended to them by the self-constituted doctors and doctresses who are so frequently met with, and who pretend to possess infallible remedies for the cure of every disease. However simple some of their prescriptions may appear to be, it often happens that they are productive of much mischief, and in all cases they are injurious, by contravening the plan of treatment adopted by the physician.

§ 7. A patient should, if possible, avoid even the *friendly visits of a physician* who is not attending him—and when he does receive them, he should never converse on the subject of his disease, as an observation may be made, without any intention of interference, which may destroy his confidence in the course he is pursuing, and induce him to neglect the directions prescribed to him. A patient should never send for a consulting physician without the express consent of his own medical attendant. It is of great importance that physicians should act in concert; for, although their

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modes of treatment may be attended with equal success when employed singly, yet conjointly they are very likely to be productive of disastrous results.

§ 8. When a patient wishes to dismiss his physician, justice and common courtesy require that he should declare his reasons for so doing.

§ 9. Patients should always, when practicable, send for their physician in the morning, before his usual hour of going out; for, by being early aware of the visits he has to pay during the day, the physician is able to apportion his time in such a manner as to prevent an interference of engagements. Patients should also avoid calling on their medical adviser unnecessarily during the hours devoted to meals or sleep. They should always be in readiness to receive the visits of their physician, as the detention of a few minutes is often of serious inconvenience to him.

§ 10. A patient should, after his recovery, entertain a just and enduring sense of the value of the services rendered him by his physician; for these are of such a character, that no mere pecuniary acknowledgment can repay or cancel them.

OF THE DUTIES OF PHYSICIANS TO EACH OTHER, AND TO THE PROFESSION AT LARGE.

ART. I.—*Duties for the support of professional character.*

§ 1. Every individual, on entering the profession, as he becomes thereby entitled to all its privileges and immunities, incurs an obligation to exert his best abilities to maintain its dignity and honor, to exalt its standing, and to extend the bounds of its usefulness. He should, therefore, observe strictly such laws as are instituted for the government of its members;—should avoid all contumelious and sarcastic remarks relative to the faculty as a body; and while, by unwearied diligence, he resorts to every honorable means of enriching the science, he should entertain a due respect for his seniors, who have, by their labors, brought it to the elevated condition in which he finds it.

§ 2. There is no profession, from the members of which greater purity of character, and a higher standard of moral excellence are required, than the medical; and to attain such eminence, is a duty every physician owes alike to his profession and to his patients. It is due to the latter, as without it he cannot command their respect and confidence, and to both, because no scientific attainments

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can compensate for the want of correct moral principles. It is also incumbent upon the faculty to be temperate in all things, for the practice of physic requires the unremitting exercise of a clear and vigorous understanding; and, on emergencies, for which no professional man should be unprepared, a steady hand, an acute eye, and an unclouded head may be essential to the well-being, and even to the life, of a fellow-creature.

§ 3. It is derogatory to the dignity of the profession to resort to public advertisements, or private cards, or handbills, inviting the attention of individuals affected with particular diseases—publicly offering advice and medicine to the poor gratis, or promising radical cures; or to publish cases and operations in the daily prints, or suffer such publications to be made; to invite laymen to be present at operations, to boast of cures and remedies, to adduce certificates of skill and success, or to perform any other similar acts. These are the ordinary practices of empirics, and are highly reprehensible in a regular physician.

§ 4. Equally derogatory to professional character is it for a physician to hold a patent for any surgical instrument or medicine; or to dispense a secret *nostrum*, whether it be the composition or exclusive property of himself or of others. For, if such nostrum be of real efficacy, any concealment regarding it is inconsistent with beneficence and professional liberality; and if mystery alone give it value and importance, such craft implies either disgraceful ignorance or fraudulent avarice. It is also reprehensible for physicians to give certificates attesting the efficacy of patent or secret medicines, or in any way to promote the use of them.

ART. II.—*Professional services of physicians to each other.*

§ 1. All practitioners of medicine, their wives, and their children while under the paternal care, are entitled to the gratuitous services of any one or more of the faculty residing near them, whose assistance may be desired. A physician afflicted with disease is usually an incompetent judge of his own case; and the natural anxiety and solicitude which he experiences at the sickness of a wife, a child, or any one who, by the ties of consanguinity, is rendered peculiarly dear to him, tend to obscure his judgment, and produce timidity and irresolution in his practice. Under such circumstances, medical men are peculiarly dependent upon each other, and kind offices and professional aid should always be cheerfully and gratuitously afforded. Visits ought not, however, to be ob-

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truded officiously; as such unasked civility may give rise to embarrassment, or interfere with that choice on which confidence depends. But, if a distant member of the faculty, whose circumstances are affluent, request attendance, and an honorarium be offered, it should not be declined; for no pecuniary obligation ought to be imposed, which the party receiving it would wish not to incur.

ART. III.—*Of the duties of physicians as respects vicarious offices.*

§ 1. The affairs of life, the pursuit of health, and the various accidents and contingencies to which a medical man is peculiarly exposed, sometimes require him temporarily to withdraw from his duties to his patients, and to request some of his professional brethren to officiate for him. Compliance with this request is an act of courtesy, which should always be performed with the utmost consideration for the interest and character of the family physician, and when exercised for a short period, all the pecuniary obligations for such service should be awarded to him. But if a member of the profession neglect his business in quest of pleasure and amusement, he cannot be considered as entitled to the advantages of the frequent and long-continued exercise of this fraternal courtesy, without awarding to the physician who officiates, the fees arising from the discharge of his professional duties.

In obstetrical and important surgical cases, which give rise to unusual fatigue, anxiety, and responsibility, it is just that the fees accruing therefrom should be awarded to the physician who officiates.

ART. IV.—*Of the duties of physicians in regard to consultations.*

§ 1. A regular medical education furnishes the only presumptive evidence of professional abilities and acquirements, and ought to be the only acknowledged right of an individual to the exercise and honors of his profession. Nevertheless, as in consultations the good of the patient is the sole object in view, and this is often dependent on personal confidence, no intelligent regular practitioner, who has a license to practise from some medical board of known and acknowledged respectability, recognized by this Association, and who is in good moral and professional standing in the place in which he resides, should be fastidiously excluded from fellowship, or his aid refused in consultation, when it is requested by the patient. But no one can be considered as a regular practi-

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tioner or a fit associate in consultation, whose practice is based on an exclusive dogma, to the rejection of the accumulated experience of the profession, and of the aids actually furnished by anatomy, physiology, pathology, and organic chemistry.

§ 2. In consultations, no rivalship or jealousy should be indulged; candor, probity, and all due respect should be exercised towards the physician having charge of the case.

§ 3. In consultations, the attending physician should be the first to propose the necessary questions to the sick; after which the consulting physician should have the opportunity to make such further inquiries of the patient as may be necessary to satisfy him of the true character of the case. Both physicians should then retire to a private place for deliberation; and the one first in attendance should communicate the directions agreed upon to the patient or his friends, as well as any opinions which it may be thought proper to express. But no statement or discussion of it should take place before the patient or his friends, except in the presence of all the faculty attending, and by their common consent; and no *opinions* or *prognostications* should be delivered which are not the result of previous deliberation and concurrence.

§ 4. In consultations, the physician in attendance should deliver his opinion first; and when there are several consulting, they should deliver their opinions in the order in which they have been called in. No decision, however, should restrain the attending physician from making such variations in the mode of treatment, as any subsequent unexpected change in the character of the case may demand. But such variation, and the reasons for it, ought to be carefully detailed at the next meeting in consultation. The same privilege belongs also to the consulting physician if he is sent for in an emergency, when the regular attendant is out of the way, and similar explanations must be made by him at the next consultation.

§ 5. The utmost punctuality should be observed in the visits of physicians when they are to hold consultation together, and this is generally practicable, for society has been considerate enough to allow the plea of a professional engagement to take precedence of all others, and to be an ample reason for the relinquishment of any present occupation. But, as professional engagements may sometimes interfere, and delay one of the parties, the physician who first arrives should wait for his associate a reasonable period, after which the consultation should be considered as postponed to

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a new appointment. If it be the attending physician who is present, he will of course see the patient and prescribe; but if it be the consulting one, he should retire, except in case of emergency, or when he has been called from a considerable distance, in which latter case he may examine the patient, and give his opinion in *writing*, and *under seal*, to be delivered to his associate.

§ 6. In consultations, theoretical discussions should be avoided, as occasioning perplexity and loss of time. For there may be much diversity of opinion concerning speculative points, with perfect agreement in those modes of practice which are founded, not on hypothesis, but on experience and observation.

§ 7. All discussions in consultation should be held as secret and confidential. Neither by words nor manner should any of the parties to a consultation assert or insinuate that any part of the treatment pursued did not receive his assent. The responsibility must be equally divided between the medical attendants—they must equally share the credit of success as well as the blame of failure.

§ 8. Should an irreconcilable diversity of opinion occur when several physicians are called upon to consult together, the opinion of the majority should be considered as decisive; but if the numbers be equal on each side, then the decision should rest with the attending physician. It may, moreover, sometimes happen, that two physicians cannot agree in their views of the nature of a case, and the treatment to be pursued. This is a circumstance much to be deplored, and should always be avoided, if possible, by mutual concessions, as far as they can be justified by a conscientious regard for the dictates of judgment. But in the event of its occurrence, a third physician should, if practicable, be called to act as umpire; and, if circumstances prevent the adoption of this course, it must be left to the patient to select the physician in whom he is most willing to confide. But, as every physician relies upon the rectitude of his judgment, he should, when left in the minority, politely and consistently retire from any further deliberation in the consultation, or participation in the management of the case.

§ 9. As circumstances sometimes occur to render a *special consultation* desirable, when the continued attendance of two physicians might be objectionable to the patient, the member of the faculty whose assistance is required in such cases, should sedulously guard against all future unsolicited attendance. As such consultations

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require an extraordinary portion both of time and attention, at least a double honorarium may be reasonably expected.

§ 10. A physician who is called upon to consult, should observe the most honorable and scrupulous regard for the character and standing of the practitioner in attendance; the practice of the latter, if necessary, should be justified as far as it can be, consistently with a conscientious regard for truth, and no hint or insinuation should be thrown out which could impair the confidence reposed in him, or affect his reputation. The consulting physician should also carefully refrain from any of those extraordinary attentions or assiduities, which are too often practised by the dishonest for the base purpose of gaining applause, or ingratiating themselves into the favor of families and individuals.

ART. V.—*Duties of physicians in cases of interference.*

§ 1. Medicine is a liberal profession, and those admitted into its ranks should found their expectations of practice upon the extent of their qualifications, not on intrigue or artifice.

§ 2. A physician in his intercourse with a patient under the care of another practitioner, should observe the strictest caution and reserve. No meddling inquiries should be made—no disingenuous hints given relative to the nature and treatment of his disorder; nor any course of conduct pursued that may directly or indirectly tend to diminish the trust reposed in the physician employed.

§ 3. The same circumspection and reserve should be observed when, from motives of business or friendship, a physician is prompted to visit an individual who is under the direction of another practitioner. Indeed, such visits should be avoided, except under peculiar circumstances; and when they are made, no particular inquiries should be instituted relative to the nature of the disease, or the remedies employed, but the topics of conversation should be as foreign to the case as circumstances will admit.

§ 4. A physician ought not to take charge of or prescribe for a patient who has recently been under the care of another member of the faculty in the same illness, except in cases of sudden emergency, or in consultation with the physician previously in attendance, or when the latter has relinquished the case, or been regularly notified that his services are no longer desired. Under such circumstances, no unjust and illiberal insinuations should be thrown out in relation to the conduct or practice previously pursued,

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which should be justified as far as candor and regard for truth and probity will permit; for it often happens that patients become dissatisfied when they do not experience immediate relief, and, as many diseases are naturally protracted, the want of success, in the first stage of treatment, affords no evidence of a lack of professional knowledge and skill.

§ 5. When a physician is called to an urgent case, because the family attendant is not at hand, he ought, unless his assistance in consultation be desired, to resign the care of the patient to the latter immediately on his arrival.

§ 6. It often happens in cases of sudden illness, or of recent accidents and injuries, owing to the alarm and anxiety of friends, that a number of physicians are simultaneously sent for. Under these circumstances, courtesy should assign the patient to the first who arrives, who should select from those present, any additional assistance that he may deem necessary. In all such cases, however, the practitioner who officiates should request the family physician, if there be one, to be called, and, unless his further attendance be requested, should resign the case to the latter on his arrival.

§ 7. When a physician is called to the patient of another practitioner, in consequence of the sickness or absence of the latter, he ought, on the return or recovery of the regular attendant, and with the consent of the patient, to surrender the case.

[The expression, "patient of another practitioner," is understood to mean a patient who may have been under the charge of another practitioner at the time of the attack of sickness, or departure from home of the latter, or who may have called for his attendance during his absence or sickness, or in any other manner given it to be understood that he regarded the said physician as his regular medical attendant.]

§ 8. A physician, when visiting a sick person in the country, may be desired to see a neighboring patient who is under the regular direction of another physician, in consequence of some sudden change or aggravation of symptoms. The conduct to be pursued on such an occasion is to give advice adapted to present circumstances; to interfere no further than is absolutely necessary with the general plan of treatment; to assume no future direction, unless it be expressly desired; and, in this last case, to request an immediate consultation with the practitioner previously employed.

§ 9. A wealthy physician should not give advice *gratis* to the affluent; because his doing so is an injury to his professional

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brethren. The office of a physician can never be supported as an exclusively beneficent one; and it is defrauding, in some degree, the common funds for its support, when fees are dispensed with which might justly be claimed.

§ 10. When a physician who has been engaged to attend a case of midwifery is absent, and another is sent for, if delivery is accomplished during the attendance of the latter, he is entitled to the fee, but should resign the patient to the practitioner first engaged.

ART. VI.—*Of differences between physicians.*

§ 1. Diversity of opinion and opposition of interest may, in the medical as in other professions, sometimes occasion controversy and even contention. Whenever such cases unfortunately occur, and cannot be immediately terminated, they should be referred to the arbitration of a sufficient number of physicians or a *court-medical.*

§ 2. As peculiar reserve must be maintained by physicians towards the public, in regard to professional matters, and as there exist numerous points in medical ethics and etiquette through which the feelings of medical men may be painfully assailed in their intercourse with each other, and which cannot be understood or appreciated by general society, neither the subject-matter of such differences nor the adjudication of the arbitrators should be made public, as publicity in a case of this nature may be personally injurious to the individuals concerned, and can hardly fail to bring discredit on the faculty.

ART. VII.—*Of pecuniary acknowledgments.*

Some general rules should be adopted by the faculty, in every town or district, relative to *pecuniary acknowledgments* from their patients; and it should be deemed a point of honor to adhere to these rules with as much uniformity as varying circumstances will admit.

OF THE DUTIES OF THE PROFESSION TO THE PUBLIC, AND OF THE OBLIGATIONS OF THE PUBLIC TO THE PROFESSION.

ART. I.—*Duties of the profession to the public.*

§ 1. As good citizens, it is the duty of physicians to be ever vigilant for the welfare of the community, and to bear their part in sustaining its institutions and burdens; they should also be ever ready to give counsel to the public in relation to matters especially

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appertaining to their profession, as on subjects of medical police, public hygiene, and legal medicine. It is their province to enlighten the public in regard to quarantine regulations—the location, arrangement, and dietaries of hospitals, asylums, schools, prisons, and similar institutions—in relation to the medical police of towns, as drainage, ventilation, etc.—and in regard to measures for the prevention of epidemic and contagious diseases; and when pestilence prevails, it is their duty to face the danger, and to continue their labors for the alleviation of the suffering, even at the jeopardy of their own lives.

§ 2. Medical men should also be always ready, when called on by the legally constituted authorities, to enlighten coroners' inquests and courts of justice, on subjects strictly medical—such as involve questions relating to sanity, legitimacy, murder by poisons or other violent means, and in regard to the various other subjects embraced in the science of Medical Jurisprudence. But in these cases, and especially where they are required to make a *post-mortem* examination, it is just, in consequence of the time, labor, and skill required, and the responsibility and risk they incur, that the public should award them a proper honorarium.

§ 3. There is no profession by the members of which eleemosynary services are more liberally dispensed than the medical, but justice requires that some limits should be placed to the performance of such good offices. Poverty, professional brotherhood, and certain of the public duties referred to in the first section of this article, should always be recognized as presenting valid claims for gratuitous services; but neither institutions endowed by the public or by rich individuals, societies for mutual benefit, for the insurance of lives or for analogous purposes, nor any profession or occupation, can be admitted to possess such privilege. Nor can it be justly expected of physicians to furnish certificates of inability to serve on juries, to perform militia duty, or to testify to the state of health of persons wishing to insure their lives, obtain pensions, or the like, without a pecuniary acknowledgment. But to individuals in indigent circumstances, such professional services should always be cheerfully and freely accorded.

§ 4. It is the duty of physicians, who are frequent witnesses of the enormities committed by quackery, and the injury to health and even destruction of life caused by the use of quack medicines, to enlighten the public on these subjects, to expose the injuries sustained by the unwary from the devices and pretensions of artful

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empirics and impostors. Physicians ought to use all the influence which they may possess, as professors in Colleges of Pharmacy, and by exercising their option in regard to the shops to which their prescriptions shall be sent, to discourage druggists and apothecaries from vending quack or secret medicines, or from being in any way engaged in their manufacture and sale.

ART. II.—*Obligations of the public to physicians.*

§ 1. The benefits accruing to the public, directly and indirectly, from the active and unwearied beneficence of the profession, are so numerous and important, that physicians are justly entitled to the utmost consideration and respect from the community. The public ought likewise to entertain a just appreciation of medical qualifications; to make a proper discrimination between true science and the assumptions of ignorance and empiricism—to afford every encouragement and facility for the acquisition of medical education—and no longer to allow the statute-books to exhibit the anomaly of exacting knowledge from physicians, under a liability to heavy penalties, and of making them obnoxious to punishment for resorting to the only means of obtaining it.

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OFFICERS

AND

PERMANENT MEMBERS.

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CATALOGUE

OF THE

OFFICERS AND PERMANENT MEMBERS

OF THE

AMERICAN MEDICAL ASSOCIATION.

PRESIDENTS AND VICE-PRESIDENTS OF THE AMERICAN MEDICAL ASSOCIATION.

1847-48.

PHILADELPHIA.

PRESIDENT.

NATHANIEL CHAPMAN, M. D., *Pennsylvania.*

VICE-PRESIDENTS.

JONATHAN KNIGHT, M. D., *Connecticut.*
ALEXANDER H. STEVENS, M. D., *New York.*
JAMES MOULTRIE, M. D., *South Carolina.*
A. H. BUCHANAN, M. D., *Tennessee.*

1848-49.

BALTIMORE.

PRESIDENT.

ALEXANDER H. STEVENS, M. D., *New York.*

VICE-PRESIDENTS.

JOHN C. WARREN, M. D., *Massachusetts.*
SAMUEL JACKSON, M. D., *Pennsylvania.*
PAUL F. EVE, M. D., *Georgia.*
W. M. AWL, M. D., *Ohio.*

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1849-50.

BOSTON.

PRESIDENT.

JOHN C. WARREN, M. D., *Massachusetts.*

VICE-PRESIDENTS.

JOHN P. HARRISON, M. D., *Ohio.*
AUSTIN FLINT, M. D., *New York.*
HUGH H. MAGUIRE, M. D., *Virginia.*
R. S. STEWART, M. D., *Maryland.*

1850-51.

CINCINNATI.

PRESIDENT.

REUBEN D. MUSSEY, M. D., *Ohio.*

VICE-PRESIDENTS.

J. B. JOHNSON, M. D., *Missouri.*
DANIEL BRAINARD, M. D., *Illinois.*
A. LOPEZ, M. D., *Alabama.*
GEORGE W. NORRIS, M. D., *Pennsylvania.*

1851-52.

CHARLESTON.

PRESIDENT.

JAMES MOULTRIE, M. D., *South Carolina.*

VICE-PRESIDENTS.

GEORGE HAYWARD, M. D., *Massachusetts.*
B. R. WELLFORD, M. D., *Virginia.*
R. D. ARNOLD, M. D., *Georgia.*
J. B. FLINT, M. D., *Kentucky.*

1852-53.

RICHMOND.

PRESIDENT.

BEVERLY R. WELLFORD, M. D., *Virginia.*

VICE-PRESIDENTS.

JONATHAN KNIGHT, M. D., *Connecticut.*
THOMAS Y. SIMONS, M. D., *South Carolina.*
JAMES W. THOMSON, M. D., *Delaware.*
C. A. POPE, M. D., *Missouri.*

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1853-54.

NEW YORK.

PRESIDENT.

JONATHAN KNIGHT, M. D., *Connecticut.*

VICE-PRESIDENTS.

USHER PARSONS, M. D., *Rhode Island.*
LEWIS CONDICT, M. D., *New Jersey.*
HENRY R. FROST, M. D., *South Carolina.*
R. L. HOWARD, M. D., *Ohio.*

1854-55.

ST. LOUIS.

PRESIDENT.

CHARLES A. POPE, M. D., *Missouri.*

VICE-PRESIDENTS.

E. D. FENNER, M. D., *Louisiana.*
N. S. DAVIS, M. D., *Illinois.*
WM. WRAGG, M. D., *South Carolina.*
JOHN GREEN, M. D., *Massachusetts.*

1855-56.

PHILADELPHIA.

PRESIDENT.

GEORGE B. WOOD, M. D., *Pennsylvania.*

VICE-PRESIDENTS.

WM. M. BOLING, M. D., *Alabama.*
DANIEL TILDEN, M. D., *Ohio.*
D. HUMPHREYS STORER, M. D., *Massachusetts.*
GRAFTON TYLER, M. D., *District of Columbia.*

1856-57.

DETROIT.

PRESIDENT.

ZINA PITCHER, M. D., *Michigan.*

VICE-PRESIDENTS.

THOMAS W. BLATCHFORD, M. D., *New York.*
E. GEDDINGS, M. D., *South Carolina.*
WM. K. BOWLING, M. D., *Tennessee.*
W. H. BRISBANE, M. D., *Wisconsin.*

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1857-58.

NASHVILLE.

PRESIDENT.

PAUL F. EVE, M. D., *Tennessee.*

VICE-PRESIDENTS.

R. J. BRECKINRIDGE, M. D., *Kentucky.*
W. H. BYFORD, M. D., *Indiana.*
D. M. REESE, M. D., *New York.*
HENRY F. CAMPBELL, M. D., *Georgia.*

1858-59.

WASHINGTON.

PRESIDENT.

HARVEY LINDSLEY, M. D., *District of Columbia.*

VICE-PRESIDENTS.

W. L. SUTTON, M. D., *Kentucky.*
JOSIAH CROSBY, M. D., *New Hampshire.*
THOMAS O. EDWARDS. M. D., *Iowa.*
W. C. WARREN, M. D., *North Carolina.*

1859-60.

LOUISVILLE.

PRESIDENT.

HENRY MILLER, M. D., *Kentucky.*

VICE-PRESIDENTS.

HENRY F. ASKEW, M. D., *Delaware.*
L. A. SMITH, M. D., *New Jersey.*
CHARLES F. TRIPLER, M. D., *United States Army.*
CALVIN WEST, M. D., *Indiana.*

1860-63.

NEW HAVEN.

PRESIDENT.

ELI IVES, M. D., *Connecticut.*

VICE-PRESIDENTS.

WILSON JEWELL, M. D., *Pennsylvania.*
JOSEPH A. LOGAN, M. D., *Georgia.*
A. B. PALMER, M. D., *Michigan.*
JOSEPH N. MCDOWELL, M. D., *Missouri.*

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1863-64.

CHICAGO.

PRESIDENT.

ALDEN MARCH, M. D., *New York.*

VICE-PRESIDENTS.

JAMES COUPER, M. D., *Delaware.*
DAVID PRINCE, M. D., *Illinois.*
CHRISTOPHER C. COX, M. D., *Maryland.*
E. S. CARR, M. D., *Wisconsin.*

1864.

NEW YORK.

PRESIDENT.

NATHAN S. DAVIS, M. D., *Illinois.*

VICE-PRESIDENTS.

W. H. MUSSEY, M. D., *Ohio.*
WORTHINGTON HOOKER, M. D., *Connecticut.*
WILLIAM WHELAN, M. D., *District of Columbia.*
F. E. B. HEINTZE, M. D., *Maryland.*

1865.

BOSTON.

The Constitution having been amended, the same officers presided also at Boston; and those elected at Boston are to preside over the meeting at Baltimore, 1866. (Vide *Transactions*, vol. xv. p. 50.)

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OFFICERS FOR 1866.

BALTIMORE.

PRESIDENT.

D. HUMPHREYS STORER, M. D., *Massachusetts.*

VICE-PRESIDENTS.

JAMES F. HIBBERD, M. D., *Indiana.*
S. O. ALMY, M. D., *Ohio.*
T. C. DUNN, M. D., *Rhode Island.*
W. P. JOHNSON, M. D., *District of Columbia.*

PERMANENT SECRETARY.

WILLIAM B. ATKINSON, M. D., *Pennsylvania.*

ASSISTANT SECRETARY.

GERARD E. MORGAN, M. D., *Maryland.*

TREASURER.

CASPAR WISTER, M. D., *Pennsylvania.*

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PERMANENT MEMBERS.

Those who have an obelisk [†] prefixed to their names are dead.

MAINE.

Allen, John L.	*Saco.*
Allen, W. H.	*Orono.*
Babb, L. P.	*Eastport.*
Boutelle, N. R.	*Waterville.*
Bradbury, James C.	*Oldtown.*
Burbank, Alexander	*Lewiston.*
Buxton, Benj. F.	*Warren.*
Chadwick, George H.	*Portland.*
Dana, Israel T.	*do.*
Emerson, N.	*Orland.*
Estabrook, Joseph H.	*Camden.*
Estabrook, Theodore S.	*Rockland.*
Fessenden, C. S. D.	*Portland.*
Foster, Thomas A.	*do.*
Frye, Thomas	*Rockland.*
Fuller, A. J.	*Bath.*
Garcelon, Alonzo	*Lewiston.*
Goodale, George L.	*Portland.*
Harris, Nathan C.	*Auburn.*
Hersey, A. L.	*Oxford.*
Hill, Hiram H.	*Augusta.*
Holmes, Job	*Calais.*
Hunkins, Seth C.	*Windham.*
Jewett, Theodore H.	*South Berwick.*
Le Prohon, E. P.	*Portland.*
Libby, Abial	*Richmond.*
Lincoln, Isaac	*Brunswick.*
Lincoln, John D.	*do.*
†McAlister, Asa	*Ellsworth.*
McKeen, James	*Topsham.*
McRuer, D.	*Bangor.*

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Millet, Charles	*Lewiston, Androscoggin Co.*
Monroe, Hollis	*Belfast.*
Monroe, N. P.	*do.*
Nourse, Amos	*Bath.*
Oakes, Sylvester	*Auburn.*
Page, A. F.	*Bucksport.*
Page, H. N.	*Penobscot.*
Palmer, G. S.	*Gardner.*
Rust, Wm. A.	*Portland.*
Seavey, Calvin	*Bangor.*
Smith, Dryden	*Biddeford.*
Stockbridge, T. D.	*Bath.*
Swan, Chas. E.	*Calais.*
Tewksbury, Samuel H.	*Portland.*
Walker, J. B.	*Union.*
Weston, J. C.	*Bangor.*
Wiggin, Henry L. K.	*Auburn.*

NEW HAMPSHIRE.

Abbott, James B.	*Sanbornton.*
Bancroft, J. B.	*Concord.*
Barney, John W.	*Lancaster.*
†Bartlett, Josiah	*Stratham.*
Bartlett, Ezra	*Exeter.*
Batcheller, James	*Fitzwilliam.*
Bean, Luther C.	*Lebanon.*
Bickford, Alphonso	*Dover.*
Boyden, F.	*Hinsdale.*
Bradley, O. H.	*E. Jaffrey.*
†Brown, Thomas	*Manchester.*
Buck, W. D.	*do.*
Call, Nathan	*Suncook.*
Carr, Alonzo F.	*Goffstown.*
†Carr, John	*Sanbornton,*
Carter, Ezra	*Concord.*
†Chase, Charles	*Deerfield.*
Crosby, Dixi	*Hanover.*
Crosby, George A.	*Manchester.*
Crosby, Josiah	*do.*
Crosby, T. R.	*Hanover.*

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Cummings, Silas	*Fitzwilliam.*
Currie, T. H.	*Enfield.*
Danforth, James	*New Boston.*
Davis, E. H.	*Manchester.*
Dickey, Abraham O.	*Lyme.*
Eastman, Josiah C.	*Hampstead.*
Eaton, Harrison	*Merrimack.*
†Fernald, John S.	*Dover.*
Fitch, Francis P.	*Milford.*
French, Leonard C.	*Manchester.*
French, Wm. F.	*Paper Mill Village.*
Gage, Charles P.	*Concord.*
Gould, True M.	*Raymond.*
Gove, George S.	*Whitefield.*
Graves, Josiah G.	*Nashua.*
†Hamilton, Cyrus B.	*Lyme.*
Haynes, Timothy	*Concord.*
Hill, Levi G.	*Dover.*
Hubbard, Oliver P.	*Hanover.*
Jarvis, Samuel G.	*Claremont.*
Kelley, S. B.	*Franklin.*
King, R. H.	*Wolfboro'.*
Knight, Luther M.	*Franklin.*
Marshall, Thomas H.	*Mason.*
†Martin, Noah.	*Dover.*
Parker, D. T.	*Farmington.*
Peabody, Leonard W.	*Epsom.*
Pierce, H.	*Winchester.*
Phillips, B. H.	*Pembroke.*
Porter, Winslow B.	*Paper Mill Village.*
Pray, T. J. W.	*Dover.*
Prescott, William	*Concord.*
Richardson, A. P.	*Marlow.*
Richardson, Samuel A.	*Marlboro'.*
†Sanborn, Nathan	*Henniker.*
Sanborn, Thomas	*New Port.*
†Sargent, J. F.	*Concord.*
Smalley, Adoniram	*Lebanon.*
Smith, Albert	*Peterborough.*
Smith, Joseph H.	*Dover.*

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Spaulding, Edward	*Nashua.*
Spaulding, Phineas	*Haverhill.*
Stackpole, P. A.	*Dover.*
Stone, W. P.	*Danbury.*
Swett, John L.	*New Port.*
Thayer, W. H.	*Keene.*
†Twitchell, Amos	*do.*
Twitchell, Geo. B.	*do.*
Webster, E. K.	*Boscawen.*
Whittemore, J. P.	*Chester.*
†Woodbury, Peter P.	*Bedford.*

VERMONT.

Adgate, Luther W.	*Irasburgh.*
Allen, Charles L.	*Rutland.*
Babcock, M. N.	*Fairfield.*
Bass, Zaccheus	*Middlebury.*
Belknap, Simeon	*Rochester.*
Blanchard, D. W.	*Coventry.*
Braby, Norman W.	*Chelsea.*
Briggs, George C.	*Franklin.*
Brigham, Charles W.	*Pittsfield.*
Brown, Hiram S.	*St. Johnsbury.*
Bullard, Gates B.	*do.*
Cahoon, Charles S.	*Lyndon.*
Campbell, Daniel	*Saxton's River.*
Carpenter, W.	*Burlington.*
Chandler, Charles B.	*Montpelier.*
Chapin, Wm. A.	*Ludlow.*
Clark, C.	*Montpelier.*
Clark, Ripley	*Windsor.*
Converse, Shubael	*Norwich.*
Cushman, Earl	*Orwell.*
Cushman, T. T.	*Lunenburgh.*
†Dana, A. G.	*Brandon.*
Downes, Charles S.	*Topsham.*
Drew, O. W.	*Waterbury.*
Emmons, Lewis	*Hartland.*
Fassett, Oscar F.	*St. Albans.*
†Hall, Charles	*Burlington.*
Harding, Abraham	*South Hero.*

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Harrington, Z. G.	*Chester.*
Hatch, Horace	*Burlington.*
Hazen, Edward	*Woodstock.*
Higginson, Francis J.	*Brattleboro'.*
Hinckley, I.	*Thetford.*
Holton, H. D.	*Putney.*
Huntington, W. M.	*Rochester.*
Janes, Henry	*Waterbury.*
Jewett, Calvin	*St. Johnsbury.*
Ketchum, Benjamin F.	*Brattleboro'.*
Knight, E. A.	*Springfield.*
Knowles, Nathan H.	*Bristol.*
M'Collom, Wm.	*Woodstock.*
Moody, W. B.	*Brownington.*
Newell, Selim	*Lyndon.*
Nichols, Samuel	*Bellows' Fall.*
Niles, H. H.	*Post Mills.*
Paine, Ezra	*Montpelier.*
Perkins, Joseph	*Castleton.*
Phelps, Edward E.	*Windsor.*
Pineo, P.	*Queechy.*
†Pitkin, A. S.	*Burlington.*
Pittman, N. J.	*Brattleboro'.*
†Ranney, W. R.	*Townshend.*
Richmond, James S.	*Woodstock.*
Rockwell, W. H.	*Brattleboro'.*
Rublee, Chauncey M.	*Montpelier.*
†Sanborn, E. K.	*Rutland.*
†Simons, Lewis E.	*Saxton's River.*
Skinner, Jonathan F.	*Barton.*
Sowyer, Longdon	*Springfield.*
Spalding, James	*Montpelier.*
Stiles, Joseph N.	*Windsor.*
Story, Dyer	*West Windsor.*
Story, D. R.	*Proctorsville.*
Summers, Lewis E.	*Saxton's River.*
Thayer, S. W.	*Burlington.*
Upham, E. F.	*West Randolph.*
Washburn, Cyrus	*Vernon.*
Watkins, E. V.	*Newburgh.*
Whiting, Laurin G.	*Chester.*

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Woodward, Adrian T.	*Brandon.*
Worcester, E. C.	*Thetford.*

MASSACHUSETTS.

†Abbe, Alanson	*Boston.*
Abbe, Edward P.	*New Bedford.*
Abbot, Samuel L.	*Boston.*
†Adams, Horace W.	*do.*
†Adams, Horatio	*Waltham.*
Adams, Nathan	*Springfield.*
†Adams, Z. Boylston	*Boston.*
Agassiz, Louis	*Cambridge.*
Ainsworth, F. S.	*Boston.*
Alden, Ebenezer	*Randolph.*
Allen, Nathan	*Lowell.*
†Alley, J. B.	*Boston.*
Ames, J. S.	*Holden.*
Atwood, George	*Fair Haven.*
Ayer, James	*Boston.*
Babbitt, Nathan S.	*North Adams.*
Bacon, John	*Boston.*
Bancroft, Amos B.	*Charlestown.*
†Bartlett, George	*Boston.*
Bartlett, John C.	*Dedham.*
Bartlett, Josiah	*Concord.*
†Bartlett, Lyman	*New Bedford.*
Barton, Edw.	*South Orange.*
†Batcheller, Stephen	*Royalston.*
Bates, Joseph N.	*Worcester.*
Bell, Artemas	*S. Hampton.*
Bell, Cyrus	*Feeding Hills.*
†Bell, Luther V.	*Charlestown.*
Bemis, C. V.	*Medford.*
†Bemis, David	*Chickopee.*
Bemis, Jonathan W.	*Charlestown.*
Bethune, George A.	*Boston.*
Bigelow, George F.	*do.*
Bigelow, Henry	*Newton.*
Bigelow, Henry J.	*Boston.*
Bigelow, Jacob	*do.*
Blake, Jeremiah	*Dracut.*

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Blake, John G.	*Boston.*
Blodgett, Julius	*West Brookfield.*
Bonney, Franklin	*Hadley.*
Borland, J. Nelson,	*Boston.*
Boutelle, Thomas R.	*Fitchburg.*
Bowditch, Henry I.	*Boston.*
Bridgman, William	*Springfield.*
Briggs, John	*Boston.*
Bronson, J. R.	*Attleboro'.*
Brown, Buckminster	*Boston.*
Brown, Francis H.	*do.*
Brown, Jonathan	*Tewksbury.*
Brown, Orlando	*Wrentham.*
Brown-Séquard, C. E.	*Cambridge.*
†Buck, Ephraim	*Boston.*
Buckingham, Charles E.	*do.*
Burgess, E. P.	*Dedham.*
Burnap, Sewall G.	*Holliston.*
Burnham, Z. P.	*Lowell.*
Cabot, Samuel	*Boston.*
Carpenter, Nelson	*Warren.*
Chace, John B.	*Taunton.*
Chaffee, C. C.	*Springfield.*
Chamberlain, C. N.	*Lawrence.*
Channing, Walter	*Boston.*
Chapin, Alonzo	*Winchester.*
Chapman, T. L.	*Long Meadow.*
Cheever, David W.	*Boston.*
Childs, H. H.	*Pittsfield.*
†Childs, Timothy	*do.*
Choate, George	*Salem*
Church, Jefferson	*Springfield.*
Clark, Henry G.	*Boston.*
†Clark, Moses	*East Cambridge.*
Clarke, Alpheus B.	*Holyoke.*
Clarke, Edward H.	*Boston.*
Clarke, Henry	*Worcester.*
Clarke, Rowse R.	*Whitinsville.*
Cleaveland, C. D.	*Boston.*
†Coale, William E.	*do.*
Cogswell, George	*Bradford.*

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Coit, Daniel T.	*Boston.*
Collins, Clarkson T.	*Great Barrington, Berkshire Co.*
Colony, George D.	*Fitchburg.*
Comstock, W. W.	*Middleboro'.*
Coolidge, James	*Athol.*
†Cornish Aaron	*New Bedford.*
Cotting, B. E.	*Roxbury.*
Cowles, Henry	*Saxonville.*
Cox, Benjamin	*Salem.*
Crane, Phineas M.	*East Boston.*
Cross, Enoch	*Newburyport.*
Curtis, Hall	*Boston.*
Curtis, Josiah	*do.*
†Cutter, Benjamin	*Woburn*
†Cutter, Nehemiah	*Pepperell.*
Dale, William J.	*Boston.*
†Dalton, Jno. C.	*Lowell.*
Damon, Howard F.	*Boston.*
Dana, David	*Lawrence.*
†Davis, C. A.	*Chelsea.*
†Davis, R. T.	*Fall River.*
Dearborne, A. D.	*Cliftondale.*
Deniston, E. E.	*North Hampton.*
Derby, Hasket	*Boston.*
Dickey, Hanover	*Lowell.*
Dix, John H.	*Boston.*
Doggott, Perez F.	*Wareham.*
Drew, S. Watson	*Woburn.*
Drowne, Henry W.	*Richmond.*
Dunlap, James	*Northampton.*
Dyer, J. Franklin	*Gloucester.*
Eastman, Edmund T.	*Boston.*
Edwards, Nathaniel B.	*North Chelmsford.*
Ellis, Calvin	*Boston.*
Fabyan, George	*do.*
Farnum, jr., J.	*Salem.*
Fay, Allen C.	*Milford.*
Fay, Charles M.	*Charlton.*
Fearing, Elisha P.	*Nantucket.*
Ferre, Henry	*Dalton.*
Field, C. C.	*Leominster.*

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Fisk, Calvin P.	*Fiskdale.*
Fisk, Samuel A.	*Northampton.*
Fiske, D. S.	*East Brookfield.*
Flint, Edward	*Leicester, Worcester Co.*
Flint, John	*Boston.*
Flint, John S.	*Roxbury,*
Fogg, David S.	*Dedham.*
Fogg, John S. H.	*Boston.*
Forsyth, James B.	*Chelsea.*
Francis, T. E.	*Brookline.*
French, Jno. O.	*Hanover.*
Gage, Daniel P.	*Lowell.*
Gage, Thomas H.	*Worcester.*
Garland, G. W.	*Lawrence.*
Garratt, Alfred C.	*Boston.*
Gay, George H.	*do.*
Gilman, B. F.	*Nantucket.*
Godding, Alvan	*Winchendon.*
Goodel, G. W.	*Greenwich.*
Gordon, Charles	*Boston.*
Gordon, Timothy	*Plymouth.*
Gordon, William A.	*New Bedford.*
Gould, Augustus A.	*Boston.*
Gould, Joshua B.	*Templeton.*
Graves, John W.	*Chelsea.*
Gray, F. H.	*Boston.*
Green, Francis C.	*E. Hampton.*
Green, John	*Boston.*
†Green John	*Worcester.*
Green, John O.	*Lowell.*
Greene, James S.	*Dorchester.*
Greene, M. C.	*Boston.*
Greene, Wm. Warren	*Pittsfield.*
Greer, Robert	*Boston.*
†Guiteau, Coridon	*Lee.*
†Hale, Enoch	*Boston.*
Hall, Adino B.	*do.*
Harlow, E. A. W.	*do.*
Harlow, James F.	*do.*
Harlow, J. M.	*Woburn.*

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Harpur, John	*Sandwich.*
Harris, Jonas C.	*West Cambridge.*
Haskell, Benjamin	*Rockport.*
Hay, Gustavus	*Boston.*
Hayden, Jno. C.	*do.*
†Hayward, George	*do.*
Hayward, George, Jr.,	*do.*
Heywood, B. F.	*Worcester, Worcester Co.*
Hitchcock, Alfred.	*Fitchburg, Worcester Co.*
Hitchcock, J. G. S.	*Foxboro'.*
Hodgdon, Richard L.	*West Cambridge.*
Holmes, Christopher C.	*Milton, Norfolk Co.*
Holmes, Oliver W.	*Boston.*
Homans, C. D.	*do.*
Homans, John	*do.*
Hooker, Anson	*East Cambridge.*
Hooker, Anson P.	*do.*
Hooper, Foster	*Fall River.*
Hooper, R. W.	*Boston.*
Hovey, Daniel	*Greenfield, Franklin Co.*
Hoskins, Thomas H.	*Boston.*
Hosmer, Alfred	*Watertown.*
†Hosmer, Hiram	*do.*
Howard, Levi	*Chelmsford.*
Howe, Appleton	*South Weymouth, Norfolk Co.*
Howe, Charles	*Raynham.*
†Howe, Zadoc	*Billerica.*
Hoyt, Enos	*Framingham.*
Hulbert, C. M.	*St. Dennis.*
Hunt, Ebenezer	*Davenport, Essex.*
†Huntington, Elisha	*Lowell.*
Hurd, Samuel H.	*Charlestown.*
Hurd, Yorick G.	*Amesbury.*
†Huse, Stephen	*Methuen.*
Hyde, George S.	*Boston.*
Inches, H. B.	*do.*
Ingals, William	*Winchester.*
Jackson, Charles T.	*Boston.*
Jackson, James	*do.*
Jackson, J. B. S.	*do.*
Jarvis, Edward	*Dorchester.*

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Jarvis, John F.	*Boston.*
Jeffries, B. Joy	*do.*
Jeffries, John	*do.*
†Jennings, Selden	*Richmond.*
Jewett, Charles C.	*Holliston.*
Jewett, George	*Fitchburg.*
Jewett, H. A.	*Northboro'.*
Jewett, Jeremiah P.	*Lowell.*
Johnson, Wm. Otis	*Boston.*
Jones, George Stevens	*do.*
Jones, Henry N.	*Kingston.*
Jones, Joseph S.	*Boston.*
Keep, N. C.	*do.*
Kemp, A. E.	*New Salem.*
†Kendall, Pierson T.	*Clinton.*
Kimball, Gilman,	*Lowell.*
Kittridge, Theodore	*Waltham.*
Lambert, Alfred	*Springfield.*
Lamb, W. D.	*Lawrence.*
Lamson, John A.	*Boston.*
Leland, Francis	*Milford.*
Leonard, Jonathan	*Sandwich.*
Leonard, M. B.	*East Boston.*
Lewis, Winslow	*Boston.*
Livingston, Alfred	*Lowell.*
Lombard, J. S.	*Boston.*
Longenecker, J. H.	*Feltonville.*
Lovejoy, Oliver S.	*Haverhill.*
Lovell, Ephraim	*West Boylston.*
Lyman, George H.	*Boston.*
Lynde, James P.	*Athol.*
Mack, William	*Salem.*
Mackie, Andrew	*New Bedford.*
Mackie, John H.	*do.*
Mann, Benjamin	*Roxbury.*
Mansfield, J. D.	*South Reading.*
Marshall, Jonas A.	*Fitchburg.*
Marsh, Lebbeus E.	*Granby.*
Martin, Oramel	*Worcester.*
Martin, S. P.	*New Braintree.*
Mason, Augustus	*Brighton.*

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McCollester, J. Q. A.	*Groton.*
Meekins, Thomas	*Williamsburg.*
Metcalf, John George	*Mendon.*
Miller, Alfred	*Fitchburg.*
Miller, Erasmus D.	*Dorchester.*
Miller, J. Leland	*Pittsfield.*
Millett, Asa	*Bridgewater.*
Miner, D. W.	*Ware.*
Minot, Francis	*Boston.*
Monroe, Alex. LeBaron	*Medway.*
Moore, E. B.	*Boston.*
†Moriarty, Jno. M.	*do.*
Morland, William W.	*do.*
Morrill, Samuel	*do.*
Morse, James R.	*North Cambridge.*
Morse, Luther B.	*Watertown.*
†Mowe, Daniel	*Lowell.*
Murphy, Joseph	*Taunton.*
Nichols, George H.	*Boston.*
Norcross, Josiah	*South Reading.*
Noyes, Josiah	*Needham.*
Nye, James M.	*Lynn.*
†Odin, jr., John	*Boston.*
Oliver, Fitch E.	*do.*
Orcutt, Almon M.	*Hardwick.*
Ordway, John P.	*Boston.*
Osgood, Jonathan W. D.	*Greenfield.*
Otis, G. A.	*Springfield.*
Page, Calvin G.	*Boston.*
Page, Horatio N.	*Chelsea.*
Page, W. H.	*Boston.*
Palmer, Edward D. G.	*do.*
Parker, D. M.	*do.*
Parker, Hiram	*Lowell.*
Parker, Moses	*Melrose.*
†Parkman, George	*Boston.*
†Parkman, Samuel	*do.*
Parks, jr., Luther	*do.*
Patch, Franklin Fletcher	*do.*
Peck, Wm. D.	*Sterling.*

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Peirce, G. W.	*Leominster.*
†Peirson, A. L.	*Salem.*
Peirson, E. B.	*do.*
Perkins, Edward A.	*Boston.*
Perkins, George A.	*Salem.*
Perkins, Henry C.	*Newburyport.*
†Perkins, John P.	*Great Barrington.*
†Perry, M. S.	*Boston.*
Phelps, Thaddeus	*Attleborough.*
Pierce, John	*Edgartown.*
Pillsbury, Harlin	*Lowell.*
Pillsbury, Harlin H.	*Medford.*
†Pillsbury, John D.	*Lowell.*
†Pond, Benjamin	*Westborough.*
Poole, Alexander	*Chelsea.*
Porter, jr., Joshua N.	*N. Brookfield.*
†Pratt, Calvin B.	*Bridgewater.*
Pratt, Jefferson	*Hopkinton.*
Presbrey, Silas D.	*Taunton.*
Puffer, Chenery	*Shelburne Falls.*
Putnam, C. G.	*Boston.*
Read, William	*Boston.*
Reynolds, Edward	*do.*
Reynolds, John P.	*do.*
Reynolds, Joseph	*Concord.*
Rice, David	*Leverett.*
Richards, Wolcott	*Roxbury.*
Richardson, Horace	*Boston.*
Richardson, Samuel	*Watertown.*
Robinson, J. Henry	*Southboro'.*
Robbins, James W.	*Uxbridge.*
Root, O. S.	*Pittsfield.*
Root, Martin	*Byfield.*
Ruppaner, A.	*Boston.*
Russell, Henry	*do.*
Russell, Ira	*Natick.*
Russell, Le Baron	*Boston.*
Sabin, Henry L.	*Williamstown.*
Salisbury, Stephen	*Brookline.*
Salter, Richard H.	*Boston.*
Sargent, Joseph	*Worcester.*

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†Sargent H.	*Worcester.*
Sargent, Seneca	*Lawrence.*
Saville, Henry M.	*Boston.*
Savory, Charles A.	*Lowell.*
Seymour, Levi Dwight	*Greenfield.*
Shackford, Chas. H.	*Chelsea.*
Shattuck, George C.	*Boston.*
Shaw, Benjamin S.	*do.*
Sheldon, L. R.	*do.*
Shurtleff, Augustine	*Brookline.*
Shurtleff, Nathaniel B.	*Boston.*
Sinclair, Alexander D.	*do.*
Slade, Daniel D.	*do.*
Smith, David P.	*Springfield.*
†Smith, James M.	*do.*
Smith, Jerome C.	*Somerville.*
Smythe, James	*Boston.*
†Snow, A. B.	*do.*
Southwick, Moses D.	*Millville.*
Spaulding, Joel	*Lowell.*
Spaulding, Miles	*Groton.*
Spofford, Jeremiah	*Greenland.*
Spooner, John P.	*Milton.*
†Spooner, Paul	*New Bedford.*
Sprague, Francis P.	*Boston.*
Sprague, Seth L.	*do.*
Stedman, Charles H.	*do.*
Stetson, James A.	*Quincy.*
Stevens, Francis J.	*Haverhill.*
Stevens, William F.	*Stoneham.*
Stickney, Chas. D.	*New Bedford.*
Stimson, Jeremy	*Dedham.*
Stone, Eben	*Walpole.*
†Stone, James W.	*Boston.*
†Stone, Joseph	*Hardwick.*
Stone, Henry O.	*Salem.*
Storer, D. Humphreys	*Boston.*
Storer, Horatio R.	*do.*
Stratton, Elijah	*Northfield.*
Street, Charles C.	*Boston.*

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Sullivan, John L.	*Malden.*
Taylor, Ashmun H.	*Shelburne Falls.*
Taylor, John P.	*East Cambridge.*
Taylor, jr., Nathaniel W.	*Springfield.*
Thaxter, Duncan M. B.	*Boston.*
Thomas, Alex.	*Dorchester.*
Thomas, Alex. T.	*Boston.*
Thompson, Austin W.	*Northampton.*
†Thompson, James	*do.*
Thomson, George N.	*Boston.*
†Thomson, Horatio	*Belchertown.*
Thorndike, William	*Beverly.*
Thorndike, Wm. H.	*Boston.*
Torrey, Augustus	*Beverly.*
Toothaker, Samuel A.	*Wilmington.*
Towle, Samuel K.	*Haverhill.*
Townsend, S. D.	*Boston.*
Townsend, W. E.	*do.*
Tracy, Stephen	*Andover.*
Tripp, Benjamin H.	*Rutland.*
Trow, W. M.	*Haydenville.*
Tucker, George G.	*Westfield.*
Tucker, Simeon	*Stoughton.*
Tucker, Joshua	*Boston.*
Tyler, John E.	*Somerville.*
Upham, J. Baxter	*Boston.*
Wakefield, H. P.	*Reading.*
Wakefield, J. F.	*S. Malden.*
Wales, Bradford L.	*Randolph.*
Walker, Clement A.	*Boston.*
Ward, George A.	*Holyoke.*
Ward, George Whitfield	*Upton.*
Ware, Charles E.	*Boston.*
†Ware, John	*do.*
Ware, Jonathan	*Milton.*
Warren, George A.	*Hopkinton.*
†Warren, John C.	*Boston.*
Warren, Joseph H.	*do.*
Warren, J. Mason	*do.*
Warren, John W.	*do.*
Warren, Royal S.	*Waltham.*

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Watson, A. A.	*Boston.*
Webber, Samuel G.	*do.*
West, Joseph O.	*Princeton.*
Weld, Moses Williams	*Boston.*
†Wellington, T.	*West Cambridge.*
Wellington W. W.	*Cambridge.*
Wheeler, William G.	*Chelsea.*
†Wheatland, R. H.	*Salem.*
White, James C.	*Boston.*
†White, Vassal	*Curtisville P. O., Stockbridge.*
Whiting, Aug.	*Charlestown.*
†Whitney, Simon	*Framingham.*
†Whitridge, W. C.	*New Bedford.*
Wilde, James	*Duxbury.*
†Wilder, Charles W.	*Leominster.*
†Wiley, Adams	*Roxbury.*
†Willard, H.	*Boston.*
Williams, A. G.	*North Adams.*
Williams, Henry W.	*Boston.*
†Williams, Stephen W.	*Deerfield.*
†Willis, Isaac P.	*Royalston.*
Willis, John	*Brimfield.*
Winsor, Frederick	*Winchester.*
Winslow, Joseph W.	*East Hampton.*
Witter, John	*Hampden.*
Workman, William	*Worcester, Worcester Co.*
Yale, John	*Ware.*
York, Jasper H.	*Boston.*

RHODE ISLAND.

†Allen, Hiram	*Woonsocket.*
Arnold, S. Augustus	*Providence.*
Baker, George P.	*do.*
Ballou, Ariel	*Woonsocket.*
Batchelder, D. Homer	*Cranston.*
Becker, Alexander R.	*Providence.*
Brown, W. Owen	*do.*
†Brownell, Richmond	*do.*
Bullock, Otis	*Warren.*
Butler, Samuel W.	*Providence.*

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Capron, George	*Providence.*
Clapp, Sylvanus	*Pawtucket.*
†Cleveland, H.	*North Providence.*
†Clifford, Lewis W.	*Providence.*
Collins, George L.	*do.*
Dunn, Theophilus C.	*Newport.*
Eldredge, J. H.	*East Greenwich.*
†Ellis, J. James	*Bristol.*
Ely, James W. C.	*Providence.*
Fisher, C. H.	*North Scituate.*
†Fowler, Ezekiel	*Woonsocket Falls.*
Gardner, Johnson	*Providence.*
Jenckes, George W.	*Cumberland.*
Kenyon, Job	*Providence.*
King, David	*Newport.*
Mauran, Joseph	*Providence.*
Miller, Lewis L.	*do.*
Morton, Lloyd	*Pawtucket.*
Newell, Timothy	*Providence.*
Newhall, Thomas K.	*do.*
Parsons, Charles W.	*do.*
Parsons, Usher	*do.*
Peckham, F. H.	*do.*
Pierce, G. A.	*do.*
Pratt, H. P.	*do.*
Rivers, H. W.	*do.*
Snow, Ed. M.	*do.*
Traver, Wm. H.	*do.*
†Warren, J. E.	*Cumberland.*

CONNECTICUT.

Baker, Rufus	*Middletown.*
Barnes, Julius S.	*Southington.*
Barrows, Ashbel W.	*Hartford.*
†Beach, Samuel	*Bridgeport.*
Beardsley, Lucius N.	*Milford.*
Beardsley, Sheldon,	*North Branford.*
Beckwith, Josiah G.	*Litchfield.*
Bennett, Ezra P.	*Danbury.*
Bennett, Hanford N.	*Bridgeport.*
Beresford, S. B.	*Hartford.*

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Bishop, Timothy H.	*New Haven.*
Blackman, G.	*Westport.*
Blake, E. W.	*New Haven.*
Blake, J. E.	*Middletown.*
Blakeman, Rufus	*Fairfield.*
Bostwick, D. E.	*Litchfield.*
†Bowen, Samuel	*Thompson.*
Bradford, Milton	*West Woodstock.*
Brigham, Norman	*North Mansfield.*
Brinley, E. H.	*Hartford.*
Bronson, Henry	*New Haven.*
Brown, Jas.	*Waterbury.*
†Brownell, Clarence M.	*East Hartford.*
Brownell, William R.	*Hartford.*
Buell, Henry W.	*Litchfield.*
Burke, George W.	*Middletown.*
†Burr, David S.	*Westport.*
Burr, Horace	*Middlesex Co.*
Butler, John S.	*Hartford.*
Campbell, Harvey	*Voluntown.*
Canfield, Joel	*Guilford.*
Carleton, Charles M.	*Norwich.*
†Carrington, Edwin W.	*Farmington.*
†Castle, Andrew	*Woodbridge.*
Catlin, Benjamin H.	*West Meriden.*
Childs, Seth L.	*East Hartford.*
Clark, William N.	*Stafford.*
Clary, George	*Hartford.*
Cogswell, William H.	*Plainfield.*
Comings, B. N.	*New Britain.*
Comstock, Jos.	*Lebanon.*
Crary, David	*Hartford.*
Daggett, David L.	*New Haven.*
De Forest, Wm. B.	*do.*
Deming, Ralph	*Scherron.*
Dickinson, Francis L.	*Willington.*
†Downes, John K.	*New Haven.*
Downing, Eleazer B.	*Preston.*
Fowler, Remus M.	*Washington.*
Francis, D. P.	*New London.*
Gilbert, G. C. H.	*Portland.*

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Goodrich, Alfred R.	*Vernon.*
†Gourdin, Samuel	*New Haven.*
Griggs, O. B.	*Mansfield.*
Haile, Ashbel B.	*Norwich.*
†Hall, Eli	*East Hartford.*
Hall, Newton B.	*Branford.*
Hammond, Justin	*Daysville.*
†Harrison, David	*Middletown.*
Hart, Frederick A.	*Southington.*
Hastings, Panet M.	*Hartford.*
†Hatch, Johnson C.	*Kent.*
Hawley, George B.	*Hartford.*
Hawley, Roswell	*Bristol.*
Hazen, Miner C.	*Haddam.*
Hill, Edwin A.	*East Killingly.*
†Hooker, Charles	*New Haven.*
Hooker, Worthington	*do.*
Hubbard, Denison H.	*Clinton.*
Hubbard, Robert	*Bridgeport.*
Hubbard, Stephen G.	*New Haven.*
Hunt, Ebenezer K.	*Hartford.*
Hutchins, Samuel	*West Killingly.*
Hutchinson, Ira	*Cromwell.*
†Huxley, A. M.	*Goshen.*
Ives, Charles L.	*New Haven.*
†Ives, Eli	*do.*
Ives, Levi	*do.*
Ives, Nathan B.	*do.*
Jackson, James C.	*Hartford.*
Jarvis, George O.	*Portland.*
Jewitt, Pliny A.	*New Haven.*
Knight, Henry M.	*Salisbury.*
†Knight, Jonathan	*New Haven.*
†Leavenworth, Melinus C.	*Waterbury.*
Lewis, J. B.	*Vernon.*
Lindsley, Charles A.	*New Haven.*
†Lyman, Norman	*Warren.*
Lyon, Irving W.	*Hartford.*
Manwaring, R. A.	*New London.*
Matthews, H. W. E.	*New Haven.*
Matthewson, Rufus W.	*Durham.*

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McGregor, John	*Thompson, Windham Co.*
†Middlebrook, Elijah	*Trumbull.*
Miller, Gaylord B.	*Harwinton.*
Moody, G. A.	*Plainville.*
Nicoll, John	*New Haven.*
North, B. B.	*Cornwall.*
Noyes, Samuel S.	*New Canaan.*
Nye, Elisha B.	*Middletown.*
Paddock, Lewis S.	*Norwich.*
Palmer, George E.	*Stonington.*
Park, Edwin A.	*New Haven.*
Phelps, J. W.	*Wolcotville.*
†Pierson, William S.	*Windsor.*
†Pike, Nathan S.	*Sterling Hill.*
Platt, Gideon L.	*Waterbury.*
Porter, Isaac G.	*New London,*
Punderson, Samuel	*New Haven.*
Preston, G. H.	*Tolland.*
Preston, S. C.	*Hartford.*
Richardson, Wm. H.	*Mansfield.*
Rockwell, P. G.	*Waterbury.*
†Rogers, Benjamin	*Hartford.*
Russell, Gurdon W.	*do.*
Salisbury, Samuel T.	*Plymouth.*
Sanford, Leonard J.	*New Haven.*
†Seymour, George	*Litchfield.*
Shove, Harmon W.	*Woodbury.*
Silliman, jr., Benjamin	*New Haven.*
†Skinner, Alden	*Rockville.*
St. John, Gamaliel H.	*Merwinsville.*
Stillman, Roswell F.	*North Haven.*
Sumner, Charles F.	*Bolton.*
†Sumner, George	*Hartford.*
Sumner, George O.	*New Haven.*
Talcott, Alvan	*Guilford.*
Tiffany, Russell H.	*Canton.*
Totten, Thomas H.	*New Haven.*
Townsend, T. B.	*do.*
Turner, Sylvester W.	*Chester.*
Tyler, David A.	*New Haven.*
Warner, Abner S.	*Hartford.*

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†Warner, Richard	*Cromwell.*
†Webb, Reynold	*Madison.*
†Welch, Archibald	*Hartford.*
Welch, Benjamin	*Lakeville.*
Welch, James	*Winchester.*
Welch, James	*Winsted.*
Welch, William W.	*Norfolk.*
Welsh, John H.	*do.*
White, Moses C.	*New Haven.*
White, Roderick A.	*Simsbury.*
Wilcox, J. D.	*West Granby.*
Wilcox, Lucian Sumner	*Hartford.*
Williams, A. L.	*Brookfield.*
Williams, Lewis	*Pomfret.*
†Wilson, Myron W.	*Hartford.*
†Witter, William	*Willimantic.*
Wood, William	*East Windsor Hill.*
Woodruff, William	*Thompson.*
Woodward, Ashbel	*Franklin.*
Woodward, Charles	*Middletown.*
Worthington, Albert B.	*Middle Haddam.*
Wright, Albert A.	*Canaan.*

NEW YORK.

Acosta, E.	*New York.*
Adams, Hiram	*Fabius.*
Adams, John G.	*New York.*
Agnew, Cornelius R.	*do.*
Aigner, Godfrey.	*do.*
Alba, E. M.	*Angelica, Alleghany Co.*
Allen, R. L.	*Saratoga Springs.*
Allen, Lucius A.	*Owego, Tioga Co.*
Allen, Lucius H.	*Owego.*
Allin, Charles M.	*Flushing, L. I.*
Anderson, James	*New York.*
Anderson, W. C.	*Stapleton.*
Armsby, James H.	*Albany.*
Armstrong, E. W.	*Rochester.*
Arnold, E. S. F.	*Yonkers.*
Atwater, D. F.	*Brooklyn.*
Austin, James M.	*Waterford.*

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Ayres, Daniel	*Brooklyn.*
Ayres, Daniel	*Amsterdam.*
Babcock, Charles	*New Hartford, Oneida Co.*
Babcock, M. N.	*Saratoga Springs.*
Bache, B. F.	*Brooklyn.*
Bacon, Charles G.	*Fulton.*
Bahan, Thomas S.	*New York.*
Baker, jr., A.	*Norwich.*
Ball, John	*Brooklyn.*
Banks, James L.	*New York.*
Barker, B. Fordyce	*do.*
Barnett, C. V.	*Windham Centre, Greene Co.*
Barrett, S.	*Le Roy.*
Barrows, Charles	*Clinton.*
Barry, R. A.	*New York.*
Bartlett, Homer L.	*Flatbush.*
Batchelder, J. P.	*New York.*
Bauer, Louis	*Brooklyn.*
Bay, William	*Albany.*
Baxter, Hiram	*Stillwater, Saratoga Co.*
Beadle, Edward L.	*Poughkeepsie.*
Beardsley, Edward L.	*do.*
Beardsley, Levi	*Oneida.*
Beardsley, W. H.	*Coventry,*
Beattie, Joseph	*Geneva.*
†Beck, T. Romeyn	*Albany.*
Beebe, Seneca	*McDonough, Chenango Co.*
Beecher, H. H.	*North Norwich.*
Bell, A. Nelson	*Brooklyn.*
Benton, John B.	*Spencer.*
Bibbins, W. B.	*New York.*
Birckhead, Wm. H.	*do.*
Bissell, David P.	*Utica.*
†Blair, Arba	*Rome.*
Blakeman, William N.	*New York.*
†Blatchford, Thomas W.	*Troy.*
Blawis, Reuben	*Fort Miller.*
Blumenthal, Mark	*New York.*
Bly, Douglas	*Rochester.*
Bolton, Jackson	*New York.*
Bontecou, R. B.	*Troy.*

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Borrowe, J. H.	*New York.*
Bradford, George W.	*Homer, Cortland Co.*
Brady, John A.	*Brooklyn.*
Briggs, W. H.	*Rochester.*
Brinsmade, Thomas C.	*Troy.*
Bronson, John O.	*New York.*
Brooks, Daniel	*Brooklyn.*
Brooks, P. B.	*Binghampton, Broome Co.*
Brown, H. W.	*New York.*
Brown, James L.	*do.*
Brownell, Russ B.	*do.*
Brush, H. Mortimer	*do.*
Buck, Gurdon	*do.*
Budd, A. E.	*Medford, Burlington Co.*
Budd, Charles A.	*New York.*
Budlong, Caleb	*Frankford, Herkimer Co.*
Buell, Richard M.	*Brooklyn.*
Buel, William P.	*New York.*
Bulkley, Henry D.	*do.*
Bumstead, Freeman J.	*do.*
Burdick, Francis	*Johnston.*
Burge, J. H. Hobart	*Brooklyn.*
Burr, George	*Binghampton.*
†Burton C. V. W.	*Lansingburg.*
†Burwell, Bryant	*Buffalo.*
Burwell, George N.	*do.*
Byrne, J.	*Brooklyn.*
Calkins, Alonzo	*New York.*
†Cammann, G. P.	*do.*
Carmalt, W. H.	*do.*
†Carr, Edson	*Canandaigua, Ontario Co.*
Carrington, Henry A.	*Lansingburg.*
Cary, Walter	*Buffalo.*
Carter, Galen	*New York.*
Case, Jonathan H.	*Albany.*
Casey, James E.	*Mohawk.*
Casey, W. B.	*New York.*
†Cash, Merrit H.	*Ridgebury, Orange Co.*
Chamberlayne, J. K.	*Cazenovia.*
Chapman, E. N.	*Brooklyn.*

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Cheeney, E. W.	*Canandaigua.*
†Cheeseman, Jno. C.	*New York.*
Child, T.	*do.*
Chubbuck, H. S.	*Elmira, Chenango Co.*
Church, W. Henry	*New York.*
Clark, Alonzo	*do.*
Clarke, A. Bryant	*Brooklyn.*
Clements, James W. G.	*do.*
Cleveland, J. M.	*Utica.*
Clymer, Meredith	*New York.*
Cobb, J. V.	*Rome.*
Cock, Thomas	*New York.*
Cock, Thomas F.	*do.*
Cockcroft, James	*do.*
Coe, A. B.	*Oswego.*
Coles, Levant B.	*Batavia.*
Colt, E. N.	*Brooklyn.*
Colt, John	*Batavia.*
Colvin, Darwin	*Clyde, Wayne Co.*
†Conant, D. S.	*New York.*
Cone, Robert C.	*Louville.*
Congar, Horace M.	*Buffalo.*
Connolly, James J.	*New York.*
Cook, Simon A.	*Buskirk's Bridge.*
Cooper, James S.	*New York.*
Corliss, Hiram	*Greenwich, Washington Co.*
Corson, J. W.	*New York.*
Corson, J.	*do.*
Cotes, John	*Batavia.*
Coventry, C. B.	*Utica.*
Crafts, E. G.	*Binghampton.*
Crandall, R. O.	*Owego.*
Crandell, C. M.	*Belfast, Alleghany Co.*
Crane, James	*Brooklyn.*
Crane, Joseph S.	*New York.*
Crispell, Abm.	*Rondout.*
Crittenden, A. G.	*Clifton Springs, Ontario Co.*
Curry, James Hart	*Shrub Oak, West Co.*
Dallas, Alex. J.	*Camillus, Onondaga Co.*
Dalton, John C.	*New York.*
Dana, Samuel W.	*do.*

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Daniels, E.	*Union, Broome Co.*
Davis, E. H.	*New York.*
Davis, Henry G.	*do.*
Dean, H. W.	*Rochester.*
Delafield, Edward	*New York.*
Delano, B. L.	*Lockport.*
Deming, J. P. H.	*Palmyra.*
Dering, Nicoll H.	*Utica.*
Detmold, W.	*New York.*
Didama, Henry P.	*Syracuse.*
Dodge, D. A.	*Brooklyn.*
Donaghe, William R.	*New York.*
Donoughue, D. O.	*Bergen, Genesee Co.*
Doolittle, A. F.	*Herkimer.*
Douglas, Isaac H.	*Utica.*
Douglas, J. Hancock	*New York.*
Downs, Henry S.	*do.*
Drake, Benjamin	*do.*
Draper, John W.	*do.*
Dubois, Abram	*do.*
Dudley, Wm. H.	*Brooklyn.*
Dunlap, James P.	*Syracuse.*
†Dwight, W. C.	*Moscow, Livingston Co.*
†Dwight, William W.	*New York.*
Dwyer, John	*do.*
Earle, Pliny	*do.*
Eastman, M. H.	*Owego.*
Eliot, Ellsworth.	*New York.*
Eliot, jr., Geo. T.	*do.*
Elsberg, Louis	*do.*
Ely, W. W.	*Rochester.*
Emmet, Thomas Addis	*New York.*
Enos, De Witt C.	*Brooklyn.*
Farnham, Horace P.	*New York.*
Farrington, J. O.	*do.*
Ferguson, James	*Glenn's Falls, Warren Co.*
Ferguson, Jno. T.	*New York.*
Fisher, George J.	*Sing Sing.*
Finnell, Thomas C.	*New York.*
Fitch, Almiron	*Delhi, Delaware Co.*
Flint, Austin	*New York.*

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Flint, jr., Austin	*New York.*
Folsom, Levi	*do.*
Ford, Corydon L.	*Lockport.*
Foster, Joel	*New York.*
Foster, S. Conant	*do.*
Fox, Eli	*Germanflatts, Herkimer Co.*
†Francis, John W.	*New York.*
Frankel, Julius	*do.*
Freeman, Norman K.	*West Farms, West Chester Co.*
Freeman, N. Marston	*New York.*
French, S. H.	*Lisle, Broome Co.*
Furman, Guido	*New York.*
Gardner, Augustus K.	*do.*
Garrish, John P.	*do.*
Gay, C. C. F.	*Buffalo.*
Gaylord, L. Merriman	*Sodus.*
Gilfillan, Wm.	*Brooklyn.*
†Gilman, Chandler R.	*New York.*
Glück, Isidore	*do.*
Gomez, Horatio	*do.*
Goodsell, Thomas	*Utica.*
Goodyear, Miles	*Cortland.*
Gould, William	*Buffalo.*
Govan, Wm.	*Stony Point.*
Gray, Henry C.	*North White Creek.*
Green, David	*New York.*
Green, Horace	*do.*
Green, Tobias J.	*Parrish, Oswego Co.*
Green, Caleb	*Homer, Cortland Co.*
†Green, Isaac	*New York.*
Greene, John W.	*do.*
Griscom, John H.	*do.*
Guleke, Hermann	*do.*
Guthrie, C. B.	*do.*
Hadley, George	*Buffalo.*
Haight, C. W.	*Pleasantville.*
Hall, Edward	*State Lunatic Asylum, Auburn.*
Halstad, T. M.	*New York.*
Hamilton, Frank H.	*do.*
Hard, P. H.	*Oswego.*
Harrington, S. H.	*Chenango Forks.*

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Harris, Elisha	*New York.*
Hart, John	*do.*
Hart, Samuel	*Brooklyn.*
Hartt, Henry Le Baron	*New York.*
Harvey, Charles W.	*Buffalo.*
Harvey, Leon F.	*do.*
†Hawley, Joel E.	*Ithaca.*
Hayes, Joseph Byron	*Canandaigua.*
Hayward, E. Darwin	*Columbus.*
Heaton, Carleton R.	*Maine.*
Henderson, F. B.	*Whitesboro'.*
Hendrick, H. C.	*McGrawville.*
Henry, James H.	*Brooklyn.*
Henschel, Charles	*New York.*
Henrigues, A. J.	*do.*
Heywood, C. F.	*do.*
Hinton, John H.	*do.*
Hodgson, G. W.	*White Plains, West Chester Co.*
Holcomb, William Frederic	*New York.*
Homberger, Julius	*do.*
Hovey, B. L.	*Dansville.*
Hubbard, Samuel T.	*New York.*
Hubbard, Silas	*Buffalo.*
Hun, Thomas	*Albany.*
Hunt, Jacob	*Utica.*
Hunt, Sandford B.	*Buffalo.*
Husted, Nathaniel C.	*New York.*
Hutchison, J. C.	*Brooklyn.*
Hyde, Frederick	*Cortlandville.*
Hyde, Lucius	*Brooklyn.*
Ingraham, T. M.	*Flatbush.*
Jackson, Thomas	*Binghampton.*
Jackson, William H.	*New York.*
Jacobi, Abraham	*do.*
Jacobs, Ferris	*Delhi, Delaware Co.*
Janes, Edward H.	*New York.*
Jenkins, J. Foster	*Yonkers.*
Jerome, James H.	*Trumansburg.*
Jewett, C.	*Buffalo.*
Jewett, Harvey	*Canandaigua.*
†Jones, Daniel T.	*Baldwinsville.*

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Jones, E. Lee	*New York.*
Jones, Joseph B.	*Brooklyn.*
Keene, Stephen S.	*New York.*
Keese, Hobart	*do.*
Kennedy, James	*do.*
Kiernan, James L.	*do.*
Kissam, Daniel E.	*Brooklyn.*
†Kissam, R. S.	*New York.*
Kneeland, Jonathan	*Onondaga.*
Krackowizer, Ernest	*New York.*
Lansing, John V.	*Albany.*
Laudon, D. S.	*Brooklyn.*
Lawrence, Jonathan S.	*New York.*
Lea, Isaac	*Stapleton.*
Leaming, James R.	*New York.*
Leaning, John K.	*Otsego.*
Lee, Charles A.	*Peekskill, West Chester Co.*
Lee, James	*Mechanicsville, Saratoga Co.*
Linsly, Jared	*New York.*
Little, G. S.	*Kirkwood.*
Little, James L.	*New York.*
Lockwood, T. T.	*Buffalo.*
Loines, J. P.	*New York.*
Long, Alfred J.	*Whitehall, Washington Co.*
Loomis, Alfred Lee	*New York.*
Ludlum, Wm. S.	*do.*
Lyman, Elijah S.	*Sherburne, Chenango Co.*
Lynch, John	*New York.*
MacFarlan, Ebenezer	*do.*
†Manly, James R.	*do.*
Manly, James	*Brooklyn.*
Mansfield, J. R.	*New York.*
March, Alden	*Albany.*
March, M. M.	*Manlius.*
Markoe, T. M.	*New York.*
Mason, Theo. L.	*Brooklyn.*
Mason, V. W.	*Canastown, Madison Co.*
Mason, W. H.	*Buffalo.*
McCall, John	*Utica.*
McEwen, John B.	*New York.*
†McIntyre, A.	*Palmyra.*

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McKay, Lawrence	*Rochester.*
McMillan, Charles	*Fordham.*
McNaughton, James	*Albany.*
†McNevin, Wm. H.	*New York.*
McNulty, John	*do.*
McNutt, Hiram	*Warrensburg.*
McPhail, L. C.	*Brooklyn.*
Mercer, Alfred	*Syracuse.*
Merritt, J. King	*New York.*
Metcalfe, John T.	*do.*
†Miller, John	*do.*
Miner, Julius F.	*Buffalo.*
†Miner, William	*New York.*
Minor, James M.	*Brooklyn.*
Mitchell, L. C.	*do.*
†Mitchell, Henry	*Norwich.*
Mixer, S. F.	*Buffalo.*
Moe, Erastus C.	*Groton.*
Monell, Joseph A.	*New York.*
Moore, Edw. M.	*Rochester.*
Morrell, Joseph S.	*Glen Cove, L. I.*
Morris, Moreau	*New York.*
†Morris, Philip V. N.	*Buskirk's Bridge.*
Morris, R. L.	*New York.*
†Mott, Valentine	*do.*
Mott, Walter	*Schuylerville, Saratoga Co.*
Moulton, Peter	*New Rochelle, Westchester Co.*
Neuhaus, Charles	*Brooklyn.*
Newman, James M.	*Buffalo.*
Nichell, H.	*do.*
Nivison, Nelson	*Hector.*
North, Nelson L.	*Brooklyn.*
Noyes, Henry D.	*New York.*
Odell, Evander	*Madilla, Otsego Co.*
Ogden, Benjamin	*New York.*
Ordronaux, John	*do.*
Ormiston, Robert	*Brooklyn.*
Orton, John G.	*Binghampton.*
Otterson, Andrew	*Brooklyn.*
Palmer, J. W.	*Victor, Ontario Co.*
Parker, Willard	*New York.*

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Parker, Edward H.	*Poughkeepsie.*
Parkhurst, W. H. H.	*Frankfort.*
Parmley, Eleazer	*New York.*
†Pattison, Granville S.	*do.*
Peaslee, Edmund R.	*do.*
Pelton, Lucius F.	*Mt. Kisco, West Chester Co.*
Percy, Samuel R.	*New York.*
Peters, George A.	*do.*
Phelps, E. B.	*Owego.*
Phelps, James L.	*New York.*
Philips, S. B.	*do.*
Pierce, J. B.	*Lyons.*
Pifford, Henry G.	*New York.*
Pomeroy, Charles G.	*Newark, Wayne Co.*
Pond, James O.	*New York.*
Pope, Harold H.	*Rome.*
Porter, Henry N.	*New York Mills, Oneida Co.*
Porter, Mortimer G.	*New York.*
Post, Alfred C.	*do.*
Potter, U.	*Minden, Montgomery Co.*
Prince, C.	*New York.*
Punnett, John	*do.*
Purdy, J.	*Elmira, Chemung Co.*
Purdy, Samuel A.	*New York.*
Purple, S. S.	*do.*
Quackenbush, J. V. P.	*Albany.*
Ramsay, Cyrus	*New York.*
Raphael, Benjamin J.	*do.*
Raymond, Charles H.	*do.*
Reed, A. D.	*Cincinnatus, Courtland Co.*
†Reese, D. Meredith	*New York.*
Reese, William W.	*Brooklyn.*
Reid, Jno.	*Rochester.*
Reid, Wm. W.	*do.*
Reynolds, James B.	*New York.*
Reynolds, J. H.	*Wilton, Saratoga Co.*
Reynolds, Tabor B.	*do.*
Rhoades, Sumner	*Ithaca, Tompkins Co.*
Richards, J. W.	*New York.*
Rochester, Thomas F.	*Buffalo.*
Rockwell, Wm.	*New York.*

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Rogers, Alexander W.	*New York.*
Rogers, D. L.	*New Rochelle.*
†Rogers, J. Kearney	*New York.*
Rogers, Stephen	*do.*
Root, Franklin W.	*Hamilton, Madison Co.*
Russ, J. D.	*New York.*
Russell, Wm.	*Utica, Oneida Co.*
Salmon, H. B.	*Stuyvesant.*
Sands, D. Jerome	*Rye.*
Sands, Henry B.	*New York.*
Saunders, A. L.	*Brookfield, Madison Co.*
Sayre, Lewis A.	*New York.*
Schilling, E.	*do.*
Selden, J. C.	*do.*
Shanks, John	*do.*
Shantz, Samuel E.	*Utica.*
Shelton, John D.	*Jamaica.*
Shipman, Azariah B.	*Syracuse.*
Shove, Seth	*Katonah.*
Shrady, George F.	*New York.*
Shumway, Samuel	*Essex.*
Sims, J. M.	*New York.*
†Skilton, Avery J.	*Troy.*
Smith, Albert	*New Rochelle.*
Smith, Charles D.	*New York.*
Smith, G. M.	*do.*
Smith, Hanbury	*do.*
Smith, Horatio S.	*Brooklyn.*
Smith, Jerome Candee	*New York.*
Smith, J. Lewis	*do.*
Smith, Joseph M.	*do.*
Smith, Joseph T.	*Canandaigua.*
Smith, Stephen	*New York.*
Smith, Whiting	*Whitesboro'.*
†Snow, Simeon	*Root, Montgomery Co.*
Snyder, Morgan	*Fort Plain.*
Speir, S. Fleet	*Brooklyn.*
Sprague, J. S.	*Exeter, Otsego Co.*
Sprague, L. S.	*Williamson.*
Squibb, Edward R.	*Brooklyn.*
Staats, Barent P.	*Albany.*

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Stanchfield, J. K.	*Elmira.*
Stanley, Wm. S.	*Mamaronick.*
†Sterns, John	*New York.*
Stephenson, Marcus P.	*do.*
†Stephenson, Mark	*do.*
Stevens, Alexander H.	*do.*
Stevens, L.	*Constantia, Orange Co.*
Stewart, F. Campbell	*New York.*
Stewart, James	*do.*
Stewart, Philander	*Peekskill.*
St. John, Samuel	*New York.*
Stiles, R. Cresson	*Flatbush.*
Stillman, Sidney	*Millerton.*
Stirling, Thomas B.	*New York.*
Storck, Edward	*Buffalo.*
Stout, Arthur B.	*New York.*
Stone, John O.	*do.*
Stoube, Fred.	*do.*
Strew, William W.	*do.*
Sturtevant, James M.	*Rome.*
Suckley, George	*New York.*
Sullivan, Richard J. O.	*do.*
Swaine, Chas. H.	*Cortlandville.*
Swinburne, John	*Tompkinsville, Staten Island.*
†Swett, John A.	*New York.*
†Taft, Marcus L.	*do.*
Taylor, Isaac E.	*do.*
Taylor, Wm.	*Manlius.*
Tefft, Lake I.	*Onondaga.*
Tellkampt, Theo. A.	*New York.*
Thomas, Daniel G.	*Utica.*
Thomson, Wm. H.	*New York.*
Thompson, jr., A. G.	*do.*
Thompson, A. H.	*Walden.*
Thompson, Alexander	*Aurora, Cayuga Co.*
Thorne, James	*Troy.*
Tobie, E.	*Erie Co.*
Tourtellot, Lewis A.	*Utica.*
Townsend, Howard	*Albany.*
Townsend, James C.	*Glenn Cove.*
Townsend, Morris W.	*Bergen.*

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Townsend, Wm. P.	*Goshen, Orange Co.*
Trask, James D.	*Astoria.*
Trask, J. D.	*White Plains.*
Tredwell, Samuel	*North Hempstead.*
Trenor, jr., Jno.	*New York.*
Turner, Thomas	*Flatbush.*
Tuttle, John T.	*New York.*
Underhill, Alfred	*do.*
Van Buren, Peter	*do.*
Van Buren, W. H.	*do.*
Vanderpool, S. O.	*Albany.*
Vandervoort, John L.	*New York.*
Van Dyck, Andrew	*Oswego.*
Van Hovenberg, J. O.	*Kingston.*
Van Kleek, John R.	*New York.*
Van Pelt, M. D.	*do.*
Van Rensselaer, Alexander	*do.*
Voorhies, Wm.	*Lisle, Broome Co.*
Voss, Lothar	*New York.*
Wade, T. A.	*Brooklyn.*
Walser, Theodore	*Tompkinsville, Richmond Co.*
Warner, Everardus B.	*New York.*
Warren, James	*do.*
†Watson, John	*do.*
Watts, Robert	*do.*
Webb, Edwin	*Hempstead, L. I.*
Weber, Leonard	*New York.*
Weed, Samuel	*Clyde, Wayne Co.*
Weeks, Cyrus	*New York.*
West, M. Calvin	*Rome.*
†West, S.	*Binghampton, Broome Co.*
Wey, W. C.	*Elmira.*
Whaley, James S.	*Rome, Oneida Co.*
Wheeler, Lewis C.	*Troy.*
Whitaker, I.	*Buffalo.*
Whitbeck, John F.	*Rochester.*
White, Devillo	*Sherburne, Chenango Co.*
White, James P.	*Buffalo.*
White, Oliver	*New York.*
White, S. P.	*do.*
Whittelsey, Henry N.	*do.*

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Wilbur, H. B.	*Syracuse.*
Wilbur, L. F.	*Honeoye, Ontario Co.*
†Wilcox, Charles H.	*Buffalo.*
Willard, Augustus	*Green, Chenango Co.*
†Willard, Sylvester D.	*Albany.*
Williams, William H.	*Brooklyn.*
Wilson, A. Duncan	*do.*
Winston, Gustavus S.	*New York.*
Winton, Nelson	*Havana.*
Wittman, Carl	*Brooklyn.*
†Wing, Joel A.	*Albany.*
Wolcott, S. G.	*Utica.*
Wood, Isaac	*New York.*
Wood, James R.	*do.*
Woodhull, H. W. B.	*do.*
Woodward, G.	*do.*
Wooster, Joseph	*do.*
Wotkyns, Alfred	*Troy.*
Wyckoff, C. C.	*Buffalo.*
Zabriskie, J. L.	*Flatbush.*

NEW JERSEY.

Arrowsmith, J. E.	*Keyport, Monmouth Co.*
Baldwin, Henry R.	*New Brunswick.*
Bateman, Eli E.	*Fairton.*
Bateman, Ephraim	*Cedarville.*
Bateman, B. Rush	*do.*
Blane, John	*Perryville.*
Boileau, Nathaniel B.	*Everittstown.*
Boucher, J. H.	*Newark.*
Brakeley, P. F.	*Belvidere, Warren Co.*
Butcher, Charles	*Maurice Town, Cumberland Co.*
†Canfield, J. W.	*Morristown.*
Chabert, Romeo F.	*Hoboken.*
Chetwood, G. R.	*Elizabethtown.*
Clark, C. F.	*Woodbury.*
Clark, H. C.	*do.*
Clarke, J. Henry	*Newark.*
†Cole, N. W.	*Burlington.*
Coles, Abram	*Newark.*
Coleman, J. B.	*Trenton.*

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Coleman, J. P.	*Pemberton.*
†Condict, Lewis	*Morristown.*
Conover, Robert R.	*Red Bank.*
Cook, Chas.	*Jersey City.*
Cooke, John	*Englishtown.*
Cooper, Richard M.	*Camden.*
Corson, T. J.	*Trenton.*
Corwin, J. Albert	*Newark.*
Craig, J. W.	*Plainfield.*
Cramer, I. S.	*Sergeantsville, Hunterdon Co.*
Coursen, W. S.	*Newfoundland.*
Cullen, Thomas F.	*Camden.*
Dayton, A. B.	*Middletown Point.*
Dean, Richard C.	*Camden.*
Disbrow, S. M.	*Howell.*
Dougherty, Alexander N.	*Newark.*
Elmer, William	*Bridgeton.*
English, J. S.	*Manalapan.*
Fithian, Enoch	*Greenwich.*
Fithian, Joseph	*Woodbury.*
Garrison, Charles	*Swedesboro'.*
Garrison, J. F.	*do.*
Gibbon, Quinton	*Salem.*
Goodell, George	*Plattsburg.*
Grant, Gabriel	*Newark.*
Grant, George	*do*
Gray, Alfred	*Flemington.*
Haines, Job	*Burlington.*
†Hampton, Isaac H.	*Bridgeton.*
Haven, Jonathan	*Deckerton.*
Hendry, Charles D.	*Camden Co.*
Hunt, Ezra M.	*Metuchen.*
Hunt, T. Edgar	*Clarksville.*
Janeway, J. H.	*Princeton.*
Jobs, Eugene	*Springfield.*
Johnson, John C.	*Blairstown.*
Longstreet, H. H.	*Bordentown.*
†Marsh, Elias J.	*Patterson.*
Martin, S. K.	*Martinsville.*
Moore, Charles B.	*Stillwater.*
Morford, A. D.	*Newton.*

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Mulford, Isaac L.	*Camden.*
†Munn, J. B.	*Chatham, Morris Co.*
†Nichols, Whitfield	*Newark.*
Oakley, L. W.	*Elizabeth City.*
Page, R. H.	*Columbus.*
Pennington, Samuel H.	*Newark.*
Phillips, John H.	*Pennington.*
Pierson, W.	*Orange.*
Pierson, jr., Wm.	*do.*
Porter, E. M.	*Bridgeton.*
Read, Zachariah	*Mount Holly.*
Ribble, W. B.	*Millstone.*
Rogers, Alexander W.	*Patterson.*
Ryerson, Thomas	*Newton.*
Saunders, Thomas J.	*Woodbury.*
Sayre, David M.	*Newton.*
†Schenck, F. S.	*Camden.*
Schenck, J. V.	*do.*
Sickler, J. R.	*Carpenter's Land.*
Smith, Henry	*Neshanic.*
†Smith, Lyndon A.	*Newark.*
Southard, Lott	*do.*
Stratton, B. H.	*Mount Holly.*
Stuart, J. R.	*Newton.*
Taylor, Edward	*Middletown.*
Taylor, Othniel H.	*Camden.*
Thomason, T. J.	*Perrineville.*
Thompson, Jno.	*Hoboken.*
Tomlinson, George	*Roadstown, Cumberland Co.*
Varick, Theodore R.	*Jersey City.*
Whittingham, Edward T.	*Milburn.*
Wickes, Stephen	*Orange.*
Woodhull, Addison W.	*Newark.*
Woodruff, A. D.	*Haddonfield.*

PENNSYLVANIA.

Allen, Ezra P.	*Athens.*
Andrews, James P.	*Lancaster.*
Ash, H. St. Clair	*Philadelphia.*
Ashmead, William	*do.*

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Atkinson, William B.	*Philadelphia.*
Atlee, Washington L.	*do.*
Atlee, John L.	*Lancaster.*
†Bache, Franklin	*Philadelphia.*
Bache, T. H.	*do.*
Baker, Charles L.	*Lancaster.*
Bare, A. S.	*do.*
†Baskin, George W.	*Mercer.*
Beaver, D. Llewellyn	*Reading.*
Bell, John	*Philadelphia.*
†Bertolet, P. G.	*Oley.*
Betton, Thomas F.	*Germantown.*
†Bibighaus, C. H.	*Philadelphia.*
Biddle, John B.	*do.*
Bird, J. F.	*do.*
Blair, A. R.	*York.*
Blakeslee, A. C.	*Dimocks.*
Boisnot, James S.	*Philadelphia.*
Boker, Charles S.	*do.*
†Bond, Henry	*do.*
Breitenbach, J.	*Myerstown.*
Breinig, P. B.	*Hellertown.*
Bridges, Robert	*Philadelphia.*
Brinton, John B.	*Westchester.*
Bruce, S. D.	*Pittsburg.*
Bryan, Joseph R.	*Philadelphia.*
Bryan, James	*do.*
Burden, Jesse R.	*do.*
Burns, Robert	*do.*
†Burrowes, Francis S.	*Lancaster.*
Butler, S. W.	*Philadelphia.*
Carpenter, Henry	*Lancaster.*
Carpenter, James S.	*Pottsville.*
Carson, Joseph	*Philadelphia.*
Cassidy, P.	*Lancaster.*
†Chapman, Nathaniel	*Philadelphia.*
Clark, David D.	*do.*
Coad, Joseph R.	*do.*
Coates, B. Horner	*do.*
Cohen, J. Solis	*do.*
Collins, Benjamin M.	*Doylestown.*

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Condie, D. Francis	*Philadelphia.*
Confer, J. M.	*Fasteria.*
†Conrey, Jno.	*Manayunk.*
Corse, James M.	*Philadelphia.*
Corson, Hiram	*Plymouth Meeting, Mont. Co.*
Corson, W.	*Norristown.*
Cummiskey, James	*Philadelphia.*
Cunningham, Oliver	*Beaver.*
Curtis, Levi	*Philadelphia.*
Da Costa, J. M.	*do.*
†Darlington, William	*Westchester.*
Dickson, Samuel H.	*Philadelphia.*
Dillard, T.	*do.*
†Dilworth, Samuel	*Pittsburg.*
Dorsey, J. H.	*Huntingdon.*
†Drayton, H. E.	*Philadelphia.*
†Duffield, Samuel	*Lancaster.*
Duncan, Robert	*do.*
Dunglison, Robley	*Philadelphia.*
Dyer, Ezra	*do.*
Dyer, Jno.	*Danborough.*
Edge, John P.	*Downingtown.*
Ehler, J. Augustus	*Lancaster.*
Ellmaker, Thomas	*do.*
Ely, Edward	*New Hope, Bucks Co.*
Emanuel, Manley	*Marcus Hook.*
Emerson, Gouverneur	*Philadelphia.*
Emlen, J. V.	*do.*
Eshleman, J. K.	*Lancaster Co.*
Everitt, E. A.	*Burlington, Bradford Co.*
Feay, John	*Williamsburg.*
Findley, W. R.	*Altoona.*
Fish, Augustine H.	*Philadelphia.*
Fitch, George D.	*do.*
Fleming, Andrew	*Pittsburg.*
Foulke, J. L.	*Gwynedd, Montgomery Co.*
Fox, George	*Philadelphia.*
†Fronefield, Charles	*do.*
†Gallaher, W.	*do.*
Gaston, A. K.	*Brandywine Manor, Chester Co.*
†Gazzam, Joseph P.	*Pittsburg.*

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Gebhard, Lewis P.	*Philadelphia.*
Gemmill, J. N.	*Altoona.*
Gerhard, Wm. W.	*Philadelphia.*
Gibson, William	*do.*
Gilbert, David	*do.*
Given, R. A.	*do.*
Goddard, P. B.	*do.*
Gordon, Wm. H.	*do.*
†Grant, Wm. R.	*do.*
Green, James M.	*do.*
Green, Traill	*Easton.*
†Gries, William	*Reading.*
Gross, Samuel D.	*Philadelphia.*
Gryder, M. R.	*Chestnut Level, Lancaster Co.*
Guilford, Wm.	*Lebanon.*
Halberstadt, George	*Pottsville.*
†Hallowell, Edward	*Philadelphia.*
Halsey, Calvin C.	*Montrose.*
Halsey, W. S.	*Philadelphia.*
†Handy, J. H.	*do.*
Harrison, F. C.	*Bloomsburg.*
Harry, Samuel H.	*Doe Run, Chester Co.*
Hart, Alexander C.	*Philadelphia.*
Hartshorne, Edward	*do.*
Hartshorne, Henry	*do.*
Hatfield, N. L.	*do.*
Hays, Isaac	*do.*
Heger, Anthony	*Pottsville.*
†Heister, J. P.	*Reading.*
Herbst, William	*do.*
Hewson, Addinell	*Philadelphia.*
†Hiester, Frank M.	*Reading.*
Hinkle, Franklin	*Marietta.*
Hodge, Hugh L.	*Philadelphia.*
Hollingsworth, S. L.	*do.*
Holmes, Daniel	*do.*
†Horner, Wm. E.	*do.*
Horton, George F.	*Terrytown.*
†Humes, Samuel	*Lancaster.*
Hunter, C. H.	*Reading.*
Hunt, William	*Philadelphia.*

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†Huston, Robert M.	*Philadelphia.*
Hutchinson, James Howell	*do.*
Innes, Charles	*Easton.*
Irwin, John S.	*Pittsburg.*
Jackson, R. M. J.	*Cresson.*
Jackson, Samuel (Prof.)	*Philadelphia.*
Jackson, Samuel	*do.*
James, Charles	*Easton.*
James, O. P.	*Doylestown.*
James, R. E.	*Stonechurch.*
†Janney, Benjamin S.	*Philadelphia.*
Jewell, Wilson	*do.*
Keating, William V.	*do.*
Keith, William	*do.*
Keneagy, Samuel	*Strasburg, Lancaster Co.*
Kennedy, Alfred L.	*Philadelphia.*
Kerlin, Isaac N.	*Media.*
Kerr, James W.	*York, York Co.*
†Kerfoot, George B.	*Lancaster.*
†Klapp, William H.	*Philadelphia.*
Knight, Wm. L.	*do.*
†Knox, Wm. Morrow	*Baumstown.*
Koehler, J. G.	*Schuylkill Haven.*
†Lajus, D. Paul	*Philadelphia.*
Lamb, Jno. F.	*Frankford.*
†Lang, Edmund	*Philadelphia.*
La Roche, C. Percy	*do.*
La Roche, Rene	*do.*
†Leib, Henry F.	*do.*
Leidy, Joseph	*do.*
Levick, James J.	*do.*
Levis, M. M.	*do.*
Lewis, Samuel	*do.*
Linderman, R. J.	*Doylestown.*
Littell, S.	*Philadelphia.*
Lowman, Jno.	*Johnstown, Cambria Co.*
†Luden, J. B.	*Huntingdon.*
Ludlow, J. L.	*Philadelphia.*
Mahon, O. S.	*Columbia.*
Martin, Charles H.	*Allentown.*
Martin, J. A.	*Whitemarsh.*

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Mason, E. H.	*Towando.*
†Mathews, Charles H.	*Doylestown.*
Mayburry, William	*Philadelphia.*
McClellan, J. H. B.	*do.*
McClurg, J. R.	*Chandlerville.*
McCorkle. W. S.	*Columbia.*
McCoy, G. R.	*Doylestown.*
McCoy, John M.	*Bellefonte.*
McCulloch, John	*Huntingdon.*
McIlvain, William	*York.*
Meigs, Charles D.	*Philadelphia.*
Meigs, J. Aitken	*do.*
†Mitchell, John K.	*do.*
†Mitchell, Thomas D.	*do.*
†Moore, John Wilson	*do.*
Morris, Casper	*do.*
Morris, J. Cheston	*do.*
†Morton, Samuel George	*do.*
Morton, Thomas George	*do.*
Morton, C. J.	*Springfield.*
Mosser, D. O.	*Breinigville.*
Mowry, Robert B.	*Alleghany City.*
Muhlenburg, F. H.	*Lancaster.*
Muhlenburg, Henry E.	*do.*
Murphy, Andrews	*Parkesburg, Chester Co.*
†Mütter, Thomas D.	*Philadelphia.*
†Naudain, Arnold	*do.*
Nebinger, Andrew	*do.*
Neill, John	*do.*
Newberry, Milton	*Whitemarsh.*
Norris, George W.	*Philadelphia.*
†Ogier, S. A.	*Frazer, Chester Co.*
Orlady, H.	*Petersburg, Huntingdon Co.*
Osler, O.	*Philadelphia.*
Packard, John H.	*do.*
Palmer, Henry	*York.*
Pancoast, Joseph	*Philadelphia.*
Parker, Samuel	*East Hempfield, Lancaster Co.*
†Parrish, Isaac	*Philadelphia.*
Parrish, Joseph	*Media.*
Parry, Ely	*Lancaster.*

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†Patterson, Henry S.	*Philadelphia.*
†Patterson, George W.	*do.*
Paul, J. Rodman	*do.*
†Pennypacker, I. A.	*do.*
†Pepper, William	*do.*
Phister, jr., Benjamin	*do.*
Piper, W. A.	*do.*
Pollock, A. M.	*Pittsburg.*
Price, Jacob	*West Chester.*
†Randolph, Jacob	*Philadelphia.*
Raub, J. K.	*Quarryville.*
Ream, John	*Lancaster.*
Reese, J. J.	*Philadelphia.*
†Remington, Isaac	*do.*
Richards, C. O.	*Lancaster.*
†Richardson, B.	*Montrose.*
Richardson, David D.	*Philadelphia.*
Richardson, T.	*Brooklyn.*
Richardson, W. L.	*Nesquehoning, Carbon Co.*
Richie, Robert W.	*Philadelphia.*
Rieser, Frank	*Reading.*
Rivinus, Edward F.	*West Chester.*
Rodman, Lewis	*Philadelphia.*
†Rogers, James B.	*do.*
Rogers, R. E.	*do.*
Rohrer, B.	*Columbia.*
Ross, J. D.	*Williamsburg.*
Rothrock, Abm.	*McVeytown.*
Ruschenberger, W. S. W.	*Philadelphia.*
Sargent, Winthrop	*do.*
Savery, Wm.	*do.*
†Schneck, B. F.	*Lebanon.*
Scholfield, Edwin	*Philadelphia.*
Schrack, Jno.	*Shannonville.*
Seip, Amos	*Easton.*
Sheller, Adam	*Mt. Joy, Lancaster Co.*
Shelmerdine, R. Q.	*Philadelphia.*
Shoemaker, Charles	*Jenkintown.*
Sholl, E. R.	*Reading.*
Slocum, A. M.	*Philadelphia.*
Smaltz, J. Henry	*do.*

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Smith, jr., Francis G.	*Philadelphia.*
Smith, H. H.	*do.*
Smith, H. Yale	*do.*
Smith, Latham A.	*New Milford.*
†Smith, Moses B.	*Philadelphia.*
Smith, R. K.	*do.*
†Spencer, Thomas D.	*do.*
Spooner, Edward A.	*do.*
Stanton, David	*New Brighton, Beaver Co.*
Steward, Scott	*Philadelphia.*
†Stewart, J. D.	*do.*
Stewardson, Thomas	*do.*
Stillé, Alfred	*Philadelphia.*
†Stillé, Moreton	*do.*
Stocker, A. E.	*do.*
Strawbridge, James D.	*Danville.*
Stroud, Wm. D.	*Philadelphia.*
Stubbs, J. B.	*Rock P. O., Lancaster Co.*
†Swayne, Caleb	*London Grove.*
Swift, Edward	*Easton.*
Thomas, John R.	*Wayne Co.*
†Thomas, George W.	*Norristown.*
Thomas, Isaac	*West Chester.*
†Thomas, R. P.	*Philadelphia.*
Thomason, W. D.	*Harrisburg.*
Thompson, Benjamin	*West Chester.*
Thompson, Sidney	*Spruce Creek, Huntingdon Co.*
Thompson, William S.	*Lancaster.*
Townsend, R. H.	*Philadelphia.*
Townsend, W. W.	*Chatham.*
Treadway, Fred. S.	*Williamsport.*
Treichler, S. K.	*Jonestown.*
Troth, S. N.	*Philadelphia.*
Turnbull, Laurence	*do.*
†Uhler, John	*do.*
Vanbuskirk, Wm. A.	*Pottstown, Montgomery Co.*
Wadsworth, Henry	*Philadelphia.*
†Walker, Isaac R.	*Spread Eagle, Chester Co.*
Wallace, Edward	*Reading.*
Wallace, Ellerslie	*Philadelphia.*

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Watson, William H.	*Bedford.*
Weidler, Isaac C.	*Leacock, Lancaster Co.*
West, Francis	*Philadelphia.*
Wilcox, Alexander	*do.*
Wiley, Penrose	*Leesport.*
Wilson, William J.	*Potter's Mill, Centre Co.*
Wilson, Ellwood	*Philadelphia.*
†Wiltbank, John	*do.*
Wimley, G. W.	*Limerick, Mont. Co.*
Wister, Caspar	*Philadelphia.*
Wood, George B.	*do.*
Wood, Thomas	*Muncy, Lycoming Co.*
Worthington, Wilmer	*West Chester.*
†Yardley, Thomas H.	*Philadelphia.*
Yeager, Theodore C.	*Allentown.*
Zeigler, George J.	*Philadelphia.*
Zeigler, J. L.	*Mount Joy, Lancaster Co.*
Zulick, S. M.	*Orwigsburg.*

DELAWARE.

Askew, Henry F.	*Wilmington.*
†Baker, George R.	*do.*
Bullock, W. R.	*do.*
Bush, Lewis P.	*do.*
Clark, R. H.	*Milford.*
Clawson, James Emory	*Smyrna.*
†Couper, James	*New Castle.*
Cummings, William	*Smyrna.*
†Dailey, E. D.	*do.*
Grimshaw, A. H.	*Wilmington.*
Hamilton, Wm. N.	*Cantwell's Bridge.*
Hirons, R. S. W.	*Smyrna.*
Johnson, R. P.	*Wilmington.*
Jones, W.	*Vernon.*
Jump, Isaac	*Dover.*
Merrit, John	*Middletown.*
Mitchell, J. R.	*Milford.*
†Morris, William W.	*Dover.*
†Perkins, John D.	*Smyrna.*
Porter, Robert R.	*Wilmington.*

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Rogers, T. C.	*Wilmington.*
Saulsbury, G.	*Dover.*
†Smith, Thomas Mackie	*Brandywine.*
Wales, J. P.	*do.*
Wilson, James F.	*Wilmington.*

MARYLAND.

†Alexander, Ashton	*Baltimore.*
Armitage, James	*do.*
Atkinson, Thomas C.	*do.*
†Baer, M. S.	*do.*
†Baker, Alfred	*do.*
Baldwin, E. C.	*do.*
Baltzel, W. H.	*do.*
Bates, J. W. P.	*do.*
Baxley, Willis H.	*do.*
Belt, W. F.	*Prince George.*
Bolton, James	*Baltimore.*
Bond, Thomas E.	*Falston.*
Bordley, James	*Baltimore.*
Boyd, Charles	*Frederick.*
†Briscoe, John H.	*Baltimore.*
Buckler, Thomas H.	*do.*
Chamberlaine, J. E. M.	*Easton.*
†Chew, Samuel	*Baltimore.*
Clarke, S. R.	*do.*
Cohen, Joshua S.	*do.*
Coleman, James S.	*do.*
Cox, C. C.	*do.*
Crane, W. B.	*do.*
Dallam, William M.	*Hartford Co.*
Davis, William H.	*Baltimore.*
Dawson, James	*St. Michael's, Talbot Co.*
Donaldson, Francis	*Baltimore.*
†Dorsey, Lloyd	*Frederick.*
Dulin, Alexander F.	*Baltimore.*
Dunbar, John R. W.	*do.*
Duvall, E. P.	*do.*
Duvall, W.	*Washington, Montgomery Co.*
Field, Phillip S.	*Baltimore.*

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Fonerden, John	*Baltimore.*
†Frick, Charles	*do.*
Gibson, George S.	*do.*
Gibson, J. Grigg	*Fredericktown.*
Gilman, J.	*Baltimore.*
Goldsborough, H. T.	*Easton, Talbot Co.*
†Grieves, H. G.	*Cambridge.*
Gunn, John P.	*Baltimore.*
†Handy, Samuel K.	*Princess Anne.*
Hardcastle, E. M.	*Trappe.*
†Harris, Chapin A.	*Baltimore.*
Hebb, T. W.	*Mount Olive.*
Heintze, F. E. B.	*Baltimore.*
†Hemsley, W.	*Caroline Co.*
Hopkins, Joel	*Elkridge Landing, Howard Co.*
Houck, J. W.	*Baltimore.*
Inloes, H. A.	*do.*
†Jameson, sen., Horatio G.	*do.*
†Jenkins, Solomon M.	*Easton.*
Johnstone, C.	*Baltimore.*
Kemp, W. M.	*do.*
Kennard, T. C.	*Harmony.*
Kennedy, S. D.	*Baltimore.*
Kinnemon, P. S.	*do.*
Kinney, jr., William	*do.*
Lawrence, G. W.	*Catonsville.*
Leonard, William T.	*Baltimore.*
Macgill, C.	*Hagerstown.*
McKew, D. I.	*do.*
Mahon, Ormsby S.	*Baltimore.*
Martin, Thomas W.	*Dorchester Co.*
Matthews, Thomas	*Milestown.*
Miltenberger, G. W.	*Baltimore.*
Monkur, John C. S.	*do.*
Monmonier, J. F.	*do.*
Morgan, Gerard E.	*do.*
Murray, R. (U. S. A.)	*do.*
Muse, J. A.	*Cambridge.*
O'Donnel, D. A.	*Baltimore.*
Piggott, A. S.	*do.*
Pinckney, Ninian (U. S. N.)	*Annapolis.*

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†Power, William	*Baltimore.*
Riley, William	*do.*
Roberts, George C. M.	*do.*
Robinson, Alexander C.	*do.*
†Roby, Joseph	*do.*
Sappington, J. K.	*Havre-de Grace.*
Sappington, Thomas	*Liberty, Frederick Co.*
Simpson, J. (U. S. A.)	*Baltimore.*
Smith, Nathan R.	*do.*
Smith, Samuel P.	*Cumberland.*
Steiner, L. H.	*Frederick.*
Steuart, R. S.	*Baltimore.*
Stevenson, J. S.	*do.*
Stokes, William H.	*do.*
†Teackle, John N.	*do.*
†Theobald, Elisha W.	*do.*
†Thomas, Richard H.	*do.*
†Tyler, Samuel	*Frederick.*
Van Bibber, W. C.	*Baltimore.*
Ward, J. Robert	*do.*
Warfield, Jesse L.	*Westminster, Carroll Co.*
Warren, Edward	*Baltimore.*
Webster, John Lee	*do.*
White, A. M.	*Easton.*
†White, S. N. C.	*Pooleville.*
Williams, W.	*Somerset Co.*
Wilson, H. P. C.	*Baltimore.*
Womble, P. M.	*do.*
Wroth, Peregrine	*Chestertown.*
Wynne, James	*Baltimore.*
Yeates, John L.	*do.*

DISTRICT OF COLUMBIA.

Antisell, Thos.	*Washington.*
Baxter, J. H.	*do.*
†Berry, William H.	*do.*
Bohrer, B. S.	*Georgetown.*
Boyle, Cornelius	*Washington.*
Busey, S. C.	*do.*
Coolidge, R. H.	*do.*

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Croggon, Richard C.	*Washington.*
Dove, G. M.	*do.*
Duhamel, W. I. C.	*do.*
Eliot, Johnson	*do.*
Ford, C. M.	*do.*
Garnett, A. Y. P.	*do.*
Hagner, D. R.	*do.*
Hall, J. C.	*do.*
Hellen, B. J.	*do.*
Holston, J. G. F.	*do.*
Howard, Flodoardo	*do.*
Johnston, William P.	*do.*
Jones, W.	*do.*
Lieberman, C. H.	*do.*
Lindsley, Harvey	*do.*
Loomis, Silas L.	*do.*
Lovejoy, J. W. H.	*do.*
Magruder, Hez.	*Georgetown.*
Makall, Lewis	*do.*
Miller, Thomas	*Washington.*
Morgan, James E.	*do.*
Nichols, C. H.	*do.*
Richards, Jno.	*do.*
Riley, J. C.	*do.*
Riley, Joshua	*Georgetown.*
Stone, Robert K.	*do.*
Thomas, John M.	*do.*
Todd, Seth J.	*Washington.*
Toner, J. M.	*do.*
Tyler, Grafton	*Georgetown.*
Waring, I. J.	*Washington.*
Young, Noble	*do.*

VIRGINIA.

Allen, B. W.	
Ashby, O. H.	*Culpepper C. H.*
Atkinson, Thomas P.	*Danville.*
Barr, S. B. F. C.	*Big Spring, Taylorsville.*
Belt, H. S.	*Pittsylvania.*
Bolton, James	*Richmond.*

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Brooks, John N.	*Richmond.*
Brown, I. C.	*Alexandria.*
Brown, P. F.	*Acowac.*
Browne, O. A.	*Hicksford.*
Burruss, J. L.	*Louisa C. H.*
Cabell, J. G.	*Richmond.*
Cabell, James L.	*University of Virginia.*
Carmichael, George F.	*Fredericksburg.*
Cochran, William B.	*Loudon Co.*
Coleman, J. C.	*Richmond.*
†Conway, James H.	*do.*
Cooke, A. T. M.	*Norfolk.*
Corbin, G. Lane	*Half-Way House, York Co.*
Cox, Thomas E.	*Richmond.*
Craghead, W. G.	*Danville.*
Cunningham, Jno. A.	*Richmond.*
Dillon, A. S.	*Farmville.*
Dorset, J. L.	*Genito, Powhatan Co.*
Dove, James	*Richmond.*
Dove, Jno.	*do.*
Faunt Le Roy, John	*White Post, Clarke Co.*
†Gibson, Charles Bell	*Richmond.*
Gilbert, R. H.	*Fortress Monroe.*
†Gooch, P. Claiborne	*Richmond.*
Hancock, F. W.	*do.*
Harrison, E. J.	*Cartersville P. O., Cumberland.*
Haskins, W. D.	*Richmond.*
Haxall, Robert W.	*do.*
Howard, Henry	*University of Virginia.*
Hurt, J. M.	*Halloway City.*
†Johnson, Carter P.	*Richmond.*
Johnson, James	*Hicksford.*
Joynes, Levin S.	*Richmond.*
Kemper, Charles R.	*Woodville, Rappahannock Co.*
Lake, R. P.	*Richmond.*
Lee, George	*Leesburg, Loudon Co.*
Leigh, H. G.	*Petersburg.*
Lewis, M. M.	*Alexandria.*
Lewis, T.	*Stevensville P. O., King and Queen.*
Little, John	*Richmond.*
Lumpkin, Jno. G.	*Hanover.*

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Lyle, James	*Farmville.*
Magill, Henry D.	*Leesburg.*
Mason, A. H.	*Falmouth.*
†Massie, H.	*Charlottsville.*
McCaw, J. B.	*Richmond.*
McGuire, Hugh H.	*Winchester.*
Merritt, A. T. B.	*Richmond.*
Merriwether, W. D.	*do.*
Mettauer, J. P.	*Prince Edward C. H.*
Mills, Charles S.	*Richmond.*
Moore, W. J.	*Norfolk.*
Morrison, E. A.	*Lawrence.*
Moseley, W. P.	*Buckingham.*
Nicholson, G. L.	*Middlesex Co.*
Parker, W. W.	*Richmond.*
Patteson, Samuel A.	*Manchester, Chesterfield Co.*
Patteson, W. A.	*Richmond.*
Payne, A. S.	*Paris, Fauquier Co.*
Peebles, J. F.	*Petersburg.*
Penticolas, A. E.	*Richmond.*
Phillips, W. H.	*Sublett's P. O., Powhatan Co.*
Pollard, Thomas	*Richmond.*
Powell, H. B.	*Alexandria.*
Powell, J. F.	*Middlebury.*
Power, R. H.	*Yorktown.*
Quarles, Charles	*Mechanicsville, Louisa Co.*
Randolph, Robert C.	*Mellwood P. O., Clarke Co.*
Roddey, F. W.	*Richmond.*
Schoolfield, I. N.	*Petersburg.*
Scott, Martin P.	*Richmond.*
†Selden, Henry	*Norfolk.*
Selden, William	*do.*
Silvester, R. W.	*do.*
Smith, J. W.	*Petersburg.*
Snead, Albert	*Richmond.*
Spencer, P. C.	*Petersburg.*
Tabb, J. Prosser	*Gloucester Co.*
Taylor, Kidder R.	*Columbia.*
Taylor, W. H.	*Richmond.*
Terrill, G. F.	*Caroline Co.*

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Thweatt, J. J.	*Petersburg.*
Trent, P.	*Richmond.*
Trent, W. W.	*do.*
†Trigg, Daniel	*Abingdon.*
Tucker, A. B.	*Winchester.*
Tucker, David H.	*Richmond.*
†Upshur, George L.	*Norfolk.*
Walke, J. Wistar	*Chesterfield.*
Walshe, Samuel	*Prince George Co.*
Wellford, Beverly R.	*Richmond.*
Wellford, J. S.	*Fredericksburg.*
White, Luke	*Petersburg.*
Williman, A. B.	*Norfolk.*
Wilson, G. A.	*Richmond.*
Wilson, W. E.	*do.*
Wily, J. B.	*Macon.*
Withers, Thomas	*Petersburg.*
Worsham, H. C.	*Dinwiddie.*
Wortham, A. G.	*Richmond.*
Yearby, George T.	*Eastville, Northampton.*

WEST VIRGINIA.

Bates, Wm. J.	*Wheeling.*
Creigh, Thomas	*Lewisburgh.*
Frissell, John	*Wheeling.*
Hildreth, E. A.	*do.*
Hupp, John C.	*do.*
†McElhenny, S. W.	*do.*
Patrick, S.	*Kanawha C. H.*

NORTH CAROLINA.

Belt, H. Singleton	*Winston, Forsyth C. H.*
Dewey, C. F.	*Goldsboro'.*
Dickson, J. H.	*Wilmington.*
Irwin, J. S.	*Marion.*
Gibbon, J. H.	*Charlotte.*
Happolt, C.	*Morganton.*
Jones, J. B.	*Chapel Hill.*
Mabrey, B. W.	*Tarboro'.*

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Manson, O. F.	*Lynesville.*
Mercer, Jno. R.	*Tarboro'.*
McKee, W. H.	*Raleigh.*
McKee, W. L.	*Morgantown, Burke Co.*
Myers, J. G. B.	*Washington.*
Norwood, Walter A.	*Hillsboro'.*
Pierce, A. B.	*Halifax.*
Pittman, Newson J.	*Tarboro'.*
Summerell, J. J.	*Salisbury.*
Thomas, Wm. Geo.	*Tarboro'.*
Thomas, W. G.	*Wilmington.*
Thompson, Jno. R.	*Raleigh.*
Tull, J. G.	*Newbern.*
Warren, E.	*Edenton.*
Warren, T. D.	*do.*
Warren, W. C.	*do.*
Webb, William	*Hillsboro'.*

SOUTH CAROLINA.

Bailey, R. S.	*Charleston.*
Barker, Sandford W.	*do.*
Barratt, Jno. P.	*Abbeville.*
†Bellinger, John	*Charleston.*
Bradley, B. W.	*King's Tree, Williamsburg.*
Brown, Pike	*Barwell.*
Cain, D. J.	*Charleston.*
Clawson, C. L.	*Nation Ford.*
Coffin, Amory	*Aiken.*
Crane, Joseph S.	*Columbia.*
Dawson, J. L.	*Charleston.*
De Saussure, H. W.	*do.*
Elfe, Edward	*do.*
Elliott, Thomas A.	*Orangeburg.*
Fair, Samuel	*Columbia.*
†Flagg, Beling	*Charleston.*
Ford, Wm. H.	*do.*
Frost, Henry R.	*do.*
†Gaillard, Peter C.	*do.*
Gaston, J. McF.	*Columbia.*
Geddings, E.	*Charleston.*

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Geddings, J. E. M.	*Charleston.*
Gibbes, N. H.	*St. Helena.*
Gibbs, Robert W.	*Columbia.*
Goodwyn, T. J.	*Orangeburg.*
Hazell, Andrew	*All Saints.*
Henderson, E. R.	*Blue House P. O.*
Holbrook, J. E.	*Charleston.*
Hook, J. H.	*St. Matthew's.*
Horlbeck, Elias	*Charleston.*
Horlbeck, W. C.	*do.*
Huger, W. H.	*do.*
Jervey, James P.	*do.*
Kinlock, R. A.	*do.*
Lebby, Robert	*do.*
Lynch, John	*Cheraw.*
Marshall, J. W. W.	*Abbeville C. H.*
May, Jno.	*St. George's P. O.*
Mayes, J. A.	*Maysville.*
McKain, Wiley J.	*Camden.*
Michel, M.	*Charleston.*
Michel, R. F.	*do.*
Miles, F. T.	*do.*
Miller, W. C.	*Georgetown.*
†Mitchell, Edward	*Edisto.*
Mitchell, J. S.	*Charleston.*
Mittag, J. F. G.	*Lancaster.*
Mobley, W. W.	*Lancasterville.*
Moore, M. S.	*Statebury, Sumter Co.*
Moultrie, James	*Charleston.*
Moultrie, W. L.	*St. John's, Berkley.*
Muller, G.	*Lexington.*
Ogier, T. L.	*Charleston.*
Porcher, F. Peyer	*do.*
Porcher, Francis Y.	*do.*
Prioleau, J. Ford	*do.*
Prioleau, Thomas G.	*do.*
Ravenel, St. Julien	*do.*
Ready, J. C.	*Edgefield.*
Robertson, F. M.	*Charleston.*
Robertson, T. S.	*Winsboro'.*
Rodrigues, B. A.	*Charleston.*

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Shepherd, Charles W.	*Charleston.*
†Simons, T. Y.	*do.*
Smith, Thomas	*Society Hill.*
Talley, A. N.	*Columbia.*
Waring, Morton	*Black Oak.*
White, O.	*Charleston.*
Williams, Alexander	*Chesterfield.*
Winthrop, Henry	*Charleston.*
Wragg, William F.	*do.*

GEORGIA.

Arnold, Richard D.	*Savannah.*
Banks, J. T.	*Zebulon.*
Benson, J. W.	*Savannah.*
Black, R. C.	*Augusta.*
Boring, Jesse	*La Grange.*
Boyd, A. M.	*Cave Spring, Floyd Co.*
Broadhurst, Wm.	*Augusta.*
Brown, H. W.	*Atlanta.*
Bullock, W. Gaston	*do.*
Campbell, H. F.	*Augusta.*
Campbell, Robert	*do.*
Colley, F. S.	*Monroe.*
Darnall, T. M.	*Atlanta.*
Doughty, W. H.	*Augusta.*
Dugas, L. A.	*do.*
Eve, Joseph A.	*do.*
Ford, L. D.	*do.*
Garvin, J. P.	*do.*
Gilbert, J. C.	*Perry.*
Green, James N.	*Macon.*
Harris, Juriah	*Savannah.*
Harris, Stephen N.	*do.*
Hofey, Thomas	*Columbus.*
Hollingsworth, W. T.	*Buckhead.*
Howard, J. Gordon	*Savannah.*
Jones, Jno. W.	*Atlanta.*
Jones, Jos.	*Augusta.*
Jones, W. B.	*Atlanta.*
Jones, W. S.	*Augusta.*

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Kollock, Phineas M.	*Savannah.*
Le Hardy, J. C.	*do.*
Logan, J. P.	*Atlanta.*
Means, A. H.	*Augusta.*
Moore, Richard D.	*Athens.*
Nottingham, C. B.	*Macon.*
Ogilby, Hugh J.	*Madison.*
Oliver, M. H.	*Atlanta.*
Padelford, George P.	*Savannah.*
Phinizy, T. B.	*Augusta.*
Posey, John F.	*Savannah.*
Powell, Thomas S.	*Sparta.*
Powers, N. F.	*Harrison.*
Quintard, C. T.	*Roswell.*
Read, James B.	*Savannah.*
Richardson, C. P.	*do.*
Robertson, J. G.	*do.*
Ruffin, W. R.	*Augusta.*
Simmons, J. N.	*Griffin.*
Smith, B. M.	*Atlanta.*
Thomas, A. G.	*Savannah.*
Thompson, E. J.	*Augusta.*
Tufts, Johnson B.	*Savannah.*
Walton, C. R.	*Augusta.*
Westmoreland, J. G.	*Atlanta.*

ALABAMA.

Alexander, Abm. F.	*Eutaw.*
Anderson, L. H.	*Sumpterville.*
Anderson, W. H.	*Mobile.*
Bass, W. J.	*Stevenson.*
Blakey, Boling A.	*Montgomery.*
Boling, Wm. M.	*do.*
Bozeman, N.	*do.*
Cabell, P. H.	*Selma.*
†Clanton, S. W.	*Warsaw.*
Coons, J. B.	*Courtland.*
Cotnam, T. T.	*Stevenson.*
Dement, J. J.	*Meridianville.*
Denny, A.	*Suggsville.*

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English, I. A.	*Cahaba.*
Gordon, F. E.	*Marion.*
Hargraves, J. T.	*Florence.*
Johnson, W. B.	*Marion, Perry Co.*
Jones, Benjamin	*Montgomery.*
Leftwich, W. D.	*Huntsville.*
Lopez, A.	*Mobile.*
Malone, T. Stith	*Athens.*
Meriwether, G.	*Line Creek.*
Miller, R.	*Mobile.*
Morris, J. Webb	*Courtland.*
Norris, G. D.	*New Market.*
Percival, C. F.	*Lowndes Co.*
Reese, A. J.	*Pleasant Hill.*
Reese, W. P.	*Selma.*
Sowell, J. F.	*Athens.*
Thorton, Wm. H.	*Eufaula.*
Turney, Isaac N.	*Sommerville.*
Winn, P. C.	*New Berne.*

LOUISIANA.

†Barton, Edward H.	*New Orleans.*
Beard, C.	*do.*
†Carpenter, Wm. M.	*do.*
Dowler, Bennett	*do.*
Fenner, E. D.	*do.*
†Harrison, J.	*do.*
Jones, James	*do.*
New, Robert A.	*St. Joseph.*
Nott, G. A.	*New Orleans.*
Richardson, J. G.	*do.*
Scruggs, S. O.	*Clantonville.*
Semmes, A. J.	*New Orleans.*
Simonds, J. C.	*do.*

MISSISSIPPI.

Cain, J. S.	*Pontotoc.*
Divine, K. C.	*Sharon.*
†Grafton, Thomas J.	*Rodney.*

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Keirn, G.	*Lexington, Holmes Co.*
King, James S.	*Natchez.*
Lowe, John T.	*Aberdeen.*
Shufford, F. B.	*Holly Springs.*
Williams, William G.	*Rodney.*

TENNESSEE.

Abernathy, J. J.	*Hockerville.*
Atchinson, T. A.	*Nashville.*
Avent, B. W.	*Murfreesboro'.*
Baskette, W. T.	*do.*
Bethshares, H. H.	*Nashville.*
Bowling, W. K.	*do.*
Boyd, J. M.	*Knoxville.*
Brannock, J. M.	*McLemorsville.*
Buchanan, A. H.	*Nashville.*
Burford, J. S.	*Whiteville.*
Callander, Jno. H.	*Nashville.*
Cavenagh, W. C.	*Memphis.*
Cheatham, Jno. L.	*Nashville.*
Cheatham, W. A.	*do.*
Childress, W. H.	*do.*
Clayton, H. H.	*Murfreesboro'.*
Clements, H. M.	*Clementsville.*
Clements, W. M.	*Gainsboro'.*
Cliff, D. B.	*Franklin.*
Conwell, Ira	*Nashville.*
Currey, R. O.	*Knoxville.*
Dabney, C. R.	*Clarksville.*
Dashiel, W. B.	*Shelbyville.*
Davis, P. W.	*Chapel Hill.*
Epperson, J. P.	*Pulaski.*
Estill, Wallace	*Winchester.*
Evans, R. F.	*Shelbyville.*
Eve, Paul F.	*Nashville.*
Ewing, Andrew B.	*Franklin.*
Ford, Jno. P.	*Nashville.*
Foster, R. C.	*do.*
Grant, George	*Memphis.*
Grant, George R.	*do.*

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Guthrie, C. B.	*Memphis.*
Haggard, W. D.	*Gallatin.*
Harris, S. H.	*Nashville.*
Harris, Zeno	*Memphis.*
Haskins, E. B.	*Nashville.*
Henderson, Eugene	*Murfreesboro'.*
Hoyte, James W.	*Nashville.*
Illson, B. C.	*Lebanon.*
Jennings, Thomas R.	*Nashville.*
Johnson, J. L. C.	*Clarksville.*
Jones, A.	*Shelbyville.*
Jones, W. P.	*Nashville.*
Keller, James M.	*Memphis.*
Kelly, John D.	*Nashville.*
Kennedy, Thomas J.	*Cornersville.*
Lawrence, J. M.	*Nashville.*
Lenoir, B. B.	*Lenoir.*
Lindsley, J. B.	*Nashville.*
Lipscomb, Thomas	*Shelbyville.*
Litton, A.	*Nashville.*
Logue, J.	*Rural Hill.*
Long, J. A.	*Cantrel Cross Roads.*
May, J. P.	*Nashville.*
McMurray, S. T.	*Spring Hill.*
McNutt, J. W.	*Kingston.*
Maddin, Thomas L.	*Nashville.*
Malone, H. B.	*Gallatin.*
Manlove, J. E.	*Nashville.*
Martin, Robert	*do.*
Mayfield, George A. J.	*do.*
Mayfield, S. S.	*do.*
Millington, John	*Memphis.*
Moore, W. P.	*Mitchelville.*
Morton, Jno. H.	*Nashville.*
Murrell, T. C.	*Winchester.*
Newnan, J. C.	*Nashville.*
Owen, Richard	*do.*
Park, Jno. S.	*Franklin.*
Perkins, N. C.	*do.*
Peters, Manly	*Knoxville.*
†Porter, R. M.	*Nashville.*

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Ramsey, Frank A.	*Knoxville.*
Ransom, M.	*Murfreesboro'.*
Rice, F.	*Memphis.*
Robards, H. R.	*do.*
Rodgers, James	*Knoxville.*
Sargent, B. W. (U. S. A.)	*Henry Co.*
Senter, W. D.	*Hannas P. O.*
Shanks, Lewis	*Memphis.*
Smith, G. F.	*Somerville.*
Smith, Milo	*Chattanooga.*
Stockard, W. P.	*Mount Pleasant.*
Stroud, F. B.	*Gladeville.*
Thomas, N. L.	*Clarksville.*
Towns, J. F.	*Farmville.*
Watson, Jno. M.	*Nashville.*
Wharton, S. L.	*do.*
Wheeler, E. D.	*Murfreesboro'.*
Whitaker, H. M.	*Clarksville.*
White, J. S.	*Memphis.*
White, R. G. P.	*Pulaski.*
Winston, C. K.	*Nashville.*
Winston, Jno. D.	*do.*
Woodson, T. M.	*Hannas P. O.*
Woodward, P. S.	*Nashville.*
Wright, D. F.	*do.*

KENTUCKY.

Almon, L. E.	*Underwood.*
Anderson, N. B.	*Louisville.*
Annan, Samuel	*Hopkinsville.*
Atchinson, W. A.	*Bowling Green.*
Baily, J. R.	*Hesper.*
Bayless, G. W.	*Louisville.*
Bell, T. S.	*do.*
Bemiss, S. M.	*do.*
Berkley, H.	*Bloomfield.*
Blackburn, C. J.	*Covington.*
Bradford, J. T.	*Augusta.*
Breckinridge, R. J.	*Louisville.*
Brown, E. O.	*Brandonberg.*

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Bryan, S. B.	*Brownsboro'.*
Bush, J. M.	*Lexington.*
Cain, W. S.	*Marion.*
Caldwell, W. B.	*Louisville.*
Callaway, A.	*do.*
Chambers, Wm. M.	*Covington.*
Chipley, W. S.	*Lexington.*
Cleaver, W. W.	*Lebanon.*
Cook, A. B.	*Louisville.*
Cook, J. B.	*Henderson.*
Cummins, D.	*Louisville.*
Davis, E. G.	*Underwood.*
Disnukes, Jno. L.	*Mayfield.*
Edwards, R. A.	*Wallon, Boone Co.*
†Evans, Asbury	*Covington.*
Evans, W. R.	*Harrodsburg.*
Field, S. B.	*Columbia.*
Fitch, G. N.	*Logan's Port.*
Fleming, Jno. T.	*Flemingsburg.*
Flint, J. B.	*Louisville.*
Forée, E. D.	*O. Bannons.*
Foster, J. Q. A.	*Newport.*
Freeman, D. L.	*Floydsburg.*
Gaines, R. W.	*Hopkinsville.*
Gaither, W. N.	*Empire Iron Works.*
Gardner, W. H.	*Woodsonville.*
Gilpin, W. E.	*Louisville.*
Givins, H. L.	*Lagrange.*
Goldsmith, M.	*Louisville.*
Goodloe, A. W.	*do.*
Gore, J.	*Bloomfield.*
Griffiths, D. J.	*Mt. Washington.*
Grubbs, T. H.	*Russellville.*
Hardin, Jno.	*Louisville.*
Hays, W.	*Covington.*
Hewit, R. C.	*Louisville.*
Hodge, J. A.	*Marion.*
Holt, W. D.	*Covington.*
Hopson, H.	*Paris.*
Johnston, J. C.	*Louisville.*
Landrum, J. D.	*Mayfield.*

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Letcher, R. P.	*Henderson.*
Lincoln, J.	*Louisville.*
Marshall, F.	*do.*
Marshall, N. B.	*do.*
Mattingley, C. P.	*Bardstown.*
Miller, Henry	*Louisville.*
Miller, W. H.	*Henderson.*
Montgomery, F. G.	*Hopkinsville.*
Moore, Thomas J.	*Harrodsburg.*
Norwood, Walter A.	*Henderson.*
O'Reilly, D. J.	*Louisville.*
Pollin, J. H.	*Springfield.*
Porter, L. C.	*Bowling Green.*
Powell, L.	*Louisville.*
Pusey, H. K.	*Garnetsville.*
Raphael, B. J.	*Louisville.*
Ray, L. G.	*Paris, Bourbon Co.*
Reid, S.	*Salem.*
Richardson, E.	*Monticello.*
Richardson, S. B.	*Louisville.*
Rogers, Lewis	*do.*
Ronald, G. W.	*do.*
Russell, L.	*Owensboro'.*
Satterwhite, T. P.	*Louisville.*
Settle, T. L.	*do.*
Shiveley, A. H.	*Campbellsville.*
Singleton, J. W.	*Smithland.*
Skillman, H. M.	*Lexington.*
†Sneed, W. C.	*Frankfort.*
Spillman, C. H.	*Harrodsburg.*
Stevens, B. L.	*Union, Boone Co.*
Stirman, W. D.	*Owensboro'.*
Sutton, W. L.	*Georgetown.*
Thomson, D. D.	*Louisville.*
Todd, L. B.	*Lexington.*
Turner, W. A.	*Mayfield.*
Weatherford, E. D.	*Louisville.*
Wibble, B. M.	*do.*
Wood, A. C.	*Owensboro'.*
Wood, B. S.	*Trenton.*

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Yandell, D. W.	*Louisville.*
Yandell, L. P.	*do.*

OHIO.

Agard, A. H.	*Sandusky.*
Allen, P.	*Kinsman.*
Almy, Stephen O.	*Cincinnati.*
Austin, A.	*Sandusky.*
Awl, Wm. M.	*Columbus.*
Ayres, A.	*Lasourdsville.*
Baird, James M.	*Bourneville.*
†Baker, Abraham H.	*Cincinnati.*
Baker, T. H.	*Wayne Co.*
Battles, W. S.	*Edinburgh.*
Beck, J. C.	*Cincinnati.*
Bigelow, J. M.	*Lancaster.*
Boerstler, G. H.	*do.*
Bonner, S.	*Cincinnati.*
Branson, Smith	*Chester Hill.*
Briggs, J. M.	*Marion.*
Brown, B. S.	*Bellefontaine.*
Brown, J. C.	*Urbana.*
Buckner, James H.	*Cincinnati.*
Buckner, Philip J.	*Georgetown.*
†Butterfield, J.	*Columbus.*
Carey, Abel	*Salem.*
Carroll, Thomas	*Cincinnati.*
Carson, William	*do.*
Carter, Francis	*Columbus.*
Clements, Joshua	*Dayton.*
Clendennin, William	*Cincinnati.*
Cochrane, Charles	*Sandusky.*
Comegys, C. G.	*Cincinnati.*
Conklin, H. Smith	*Sidney, Shelby Co.*
Coons, Israel A.	*Middletown.*
Corson, J.	*Portsmouth.*
Cotton, D. B.	*do.*
Cotton, J. D.	*Marietta.*
Cox, D. A.	*New Paris.*
Crane, Isaac L.	*Ashland.*

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Crews, James H.	*Upshur, Preble Co.*
Crume, Pliny M.	*Eaton, Preble Co.*
Dandridge, A. S.	*Cincinnati.*
Davis, Jno.	*Dayton.*
Davis, W. B.	*Cincinnati.*
Dawson, Jno.	*Columbus.*
Dawson, J. R.	*Bellbrook.*
Dawson, W. W.	*Cincinnati.*
Delamater, Jacob J.	*Cleveland.*
Denice, J. C.	*Dayton.*
Denig, Robert M.	*Columbus.*
Dodge, J. S.	*Cincinnati.*
Doherty, G. A.	*do.*
Dorsey, G. Volney	*Piqua.*
†Drake, Daniel	*Cincinnati.*
Dunahue, H. J.	*Sandusky.*
Dunlap, A.	*Springfield.*
Eaton, T. J.	*New Paris, Preble Co.*
Effinger, M.	*Lancaster.*
Ferris, O.	*Upper Sandusky.*
Ferris, S.	*New Westville.*
Foote, H. E.	*Cincinnati.*
Ford, James B.	*Norwalk.*
Fore, P. G.	*Cincinnati.*
Fries, George	*do.*
Fyffe, E. P.	*Urbana.*
Gaw, I. N.	*Greenville.*
Gaston, Ephraim	*Morristown.*
Gilchrist, R. S.	*De Graff.*
Gillet, B.	*Springfield.*
Gobrecht, Wm. H.	*Cincinnati.*
Gordon, Thomas W.	*Georgetown.*
Graff, M. B.	*Cincinnati.*
Graham, James	*do.*
Griswold, L. D.	*Elyria.*
Grundy, Richard	*Dayton.*
Hall, W. C.	*Fayetteville.*
Hamilton, J. W.	*Columbus.*
†Harrison, John P.	*Cincinnati.*
Heighway, A. E.	*do.*
Helmick, J.	*Harrisburg.*

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Henderson, J. P.	*Newville.*
Heterick, A. B.	*Georgetown.*
Hills, Ralph	*Columbia.*
†Howard, Richard L.	*Columbus.*
Huestis, Isaac	*Chester Hill.*
Hunt, Samuel P.	*Morrow, Warren Co.*
Hurxthal, Frederick T.	*Massillon.*
Johnson, A. M.	*Cincinnati.*
Jones, C.	*West Union.*
Jones, W. W.	*Toledo.*
Judkins, David	*Cincinnati.*
Judkins, J. P.	*do.*
†Judkins, William	*do.*
Kable, W. R.	*Bellbrook.*
Kelly, P. H.	*Waterford.*
Kendrick, Oscar C.	*Newburg.*
Kincaid, W. P.	*Neville.*
†Koehne, H. F.	*Dayton.*
Kreider, M. Z.	*Lancaster.*
Kyle, J. G.	*Xenia.*
Lamme, W. H.	*Centreville.*
Lane, E. S.	*Sandusky.*
Langdon, O. M.	*Cincinnati.*
†Lawson, L. M.	*do.*
Lecklider, L. G.	*Ansonia.*
Leighton, W. P.	*Kenton.*
Leonard, B. B.	*West Liberty.*
Mack, H. O.	*Shelby.*
†Martin, Joshua	*Xenia.*
Matson, A. F.	*Loganville.*
McArthur, J. W.	*Wilmington.*
McDermot, C.	*Dayton.*
McFarland, J. A.	*Tiffin City.*
McGrew, J. S.	*Cincinnati.*
McIlvaine, R. R.	*do.*
McMally, Thomas	*Chillicothe.*
McMeens, R. R.	*Sandusky.*
McMillen, W. L.	*Columbus.*
Mendenhall, George	*Cincinnati.*
Mitchell, G. F.	*Mansfield.*
Mosgrove, Jas. M.	*Urbana.*

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†Mount, W.	*Cincinnati.*
Moxley, M. R.	*Wheelersburg.*
Moxley, N. K.	*Ironton.*
Mullen, T. J.	*New Richmond.*
Munson, A. W.	*Kenton.*
Murphy, Jno. A.	*Cincinnati.*
Musgrave, H. B.	*do.*
Musgrove, A.	*Urbana.*
Mussey, F. B.	*Cincinnati.*
Mussey, Reuben D.	*do.*
Mussey, W. H.	*do.*
Neff, B.	*New Carlisle.*
†Norton, J. C.	*Marion.*
Norton, O. D.	*Cincinnati.*
Philips, W. H.	*Kenton.*
Potter, J. F.	*Cincinnati.*
Read, A. M.	*Norwalk.*
Richardson, B. F.	*Cincinnati.*
Rives, L. C.	*do.*
Robertson C.	*McConnelsville.*
Robison, James D.	*Wooster, Wayne Co.*
Rogers, J. G.	*New Richmond.*
Russell, John W.	*Mount Vernon.*
Sachse, J. G.	*Lancaster.*
Safford, R.	*Putnam.*
Sams, C. C.	*Hillsborough.*
Sayles, J. A.	*Cleveland.*
Scarff, W. D.	*Bellefontaine.*
Schenk, C. F.	*Columbus.*
Schenk, W. L.	*Franklin.*
Sheldon, B.	*Cleveland.*
Sibley, E. H.	*Lodi, Medina Co.*
Slusser, Lewis	*Canton.*
Smith, A. C.	*Medina C. H.*
Smith, Edwin	*Dayton.*
Smith, John A.	*Piqua.*
†Smith, J. B.	*Cincinnati.*
Smith, Samuel M.	*Columbus.*
Spillman, Henry	*Medina.*
Steele, H. K.	*Dayton.*
Stevens, E. B.	*Cincinnati.*

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Stevens, Joshua	*Lebanon.*
St. John, Samuel	*Cleveland.*
Strader, D. P.	*Cincinnati.*
Taggart, T. M.	*Dalton.*
Taggart, W. W.	*Smithville, Wayne Co.*
Taggert, J. M.	*Dalton.*
Taliaferro, W. I.	*Cincinnati.*
Tappan, B.	*Steubenville.*
Taylor, James	*Cincinnati.*
Thall, W. C.	*Fayetteville.*
Thomas, K. G.	*Alliance.*
Thompson, J. B.	*Columbus.*
Thompson, R.	*do.*
Tilden, D.	*Sandusky, Erie Co.*
Trevitt, Wm.	*Columbus.*
†Tweed, T. M.	*Eckmansville.*
Updegraff, J. T.	*Mount Pleasant.*
Vanharlingen, J.	*Lebanon.*
Vattier, J. L.	*Cincinnati.*
Walker, J. P.	*do.*
Webber, G. C. E.	*Cleveland.*
West, Henry	*Clairsville, Belmont Co.*
White, James	*Lancaster.*
White, John F.	*Cincinnati.*
White, J. W.	*Stockport.*
Whiting, A. W.	*Newburg.*
Williams, E.	*Cincinnati.*
Williams, I. C.	*Bloomington.*
Wood, Thomas	*Cincinnati.*
Woodward, Charles	*do.*
Wormley, T. G.	*Columbus.*
Wright, James	*Belmont.*
Wright, M. B.	*Cincinnati.*

INDIANA.

Austin, T. R.	*New Albany.*
Ayers, H. P.	*Fort Wayne.*
Beard, F. W.	*Corydon.*
Bigelow, A. A.	*Attica.*
Bowman, C.	*New Albany.*

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Boyd, S. S.	*Jacksonburg.*
Boynton, H. G.	*Elizabethtown.*
Brelsford, Joseph	*Plymouth.*
Brown, C.	*Indianapolis.*
Brown, J. H.	*Lawrenceburg.*
Buchtell, J. B.	*South Bend.*
†Bullard, Talbut	*Indianapolis.*
†Butler, A. B.	*Richmond.*
Cameron, R. A.	*Valpariso.*
Cary, H. G.	*Indianapolis.*
Castleberry, Isaac	*Evansville.*
Clapp, A.	*New Albany.*
Clapp, W. A.	*do.*
Cogley, T. J.	*Madison.*
Cornet, W. T. S.	*Versailles.*
Crandall, R. O.	*Laporte.*
Curran, B.	*Jeffersonville.*
Darnall, M. D.	*Bainbridge.*
Davis, J. W.	*Carlisle.*
Davis, S.	*Columbus.*
Dean, H. K.	*Mauckport.*
Dicken, James L.	*Somerset.*
Dickey, William	*Centerville.*
Erwin, A. J.	*Fort Wayne.*
Ferris, A. B.	*New Paris.*
†Fishback, C.	*Shelbyville.*
Fisher, E.	*Richmond.*
Fletcher, Wm. B.	*Indianapolis.*
Florrer, T. W.	*Alamo.*
Freeman, S. A.	*Fort Wayne.*
Green, Jno. N.	*Stilesville.*
Harding, M. H.	*Lawrenceburg.*
Haughton, R. E.	*Richmond.*
Haymond, R.	*Brookville.*
Hibberd, James F.	*Richmond.*
Higday, T.	*Laporte.*
Hinkle, J. M.	*Carlisle.*
Hitt, W. W.	*Vincennes.*
Horne, S. S.	*Marion.*
Humphries, Lewis	*South Bend.*
Hutchinson, David	*Mooresville.*

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Jennis, Samuel	*New Castle.*
Jessup, D. H.	*Rising Sun.*
John, H. V. V.	*Indianapolis.*
Johnson, Nathan	*Cambridge City, Wayne Co.*
Jones, D. M.	*Corydon.*
Kennedy, L. H.	*Belleville.*
Kersey, Vierling	*Milton.*
Kitchen, J. M.	*Indianapolis.*
Latta, Milton M.	*Goshen.*
Leedy, J. K.	*Warsaw, Kosciusko Co.*
Leonard, S. E.	*New Albany.*
Linton, S. M.	*Columbus.*
Lomax, William	*Marion.*
Lyons, W. B.	*Huntington.*
Maclean, George M.	*New Albany.*
Mantle, John R.	*Vincennes.*
Martin, William H.	*Rushville.*
Mauzey, R. D.	*do.*
Maxwell, J. D.	*Bloomington.*
McPheeters, A.	*Lavonia.*
Mears, G. W.	*Indianapolis.*
Meeker, D.	*Laporte.*
Mendenhall, Isaac	*Ashland, Henry Co.*
Moffet, Jno.	*Rushville.*
Morgan, Daniel	*Evansville.*
Mothershead, F. M.	*Indianapolis.*
†Mothershead, I. L.	*do.*
Mullen, Alexander J.	*Napoleon, Ripley Co.*
Murphy, Edward	*New Harmony, Posey Co.*
Myers, Wm. H.	*Fort Wayne.*
Newland, B.	*Bedford.*
New, G. W.	*Greensburg.*
Parr, Wm. P.	*Indianapolis.*
Parry, Charles	*do.*
Patterson, R. J.	*do.*
Pennington, Joel	*Milton, Wayne Co.*
Personnet, L. D.	*Washington.*
Reeder, W.	*Corydon.*
Riley, J. M.	*New Albany.*
Ritter, Levi	*Plainfield.*
Rodgers, J. H. D.	*Madison.*

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Ronalds, Hugh	*Evansville.*
Rose, Landon C.	*Laporte.*
Rowan, B. G.	*Fort Wayne.*
Sarbor, W. E.	*Palestine.*
Sexton, H. G.	*Rushville.*
Sheets, L. D.	*Liberty.*
Shields, P. S.	*New Albany.*
Shively, James S.	*Marion, Grant Co.*
Sloan, John	*New Albany.*
Sommes, Joseph	*Vincennes.*
Sutton, George	*Aurora.*
Sweeny, T. J.	*New Albany.*
Talbert, A. V.	*Westfield.*
Taylor, D. W.	*Julapa.*
Town, R. R.	*New Albany.*
Townsend, J. H.	*Hasland.*
Vickey, A. M.	*Indianapolis.*
†West, Calvin	*Hagerstown.*
Windle, J. A.	*Bluntsville.*
Winton, Wm. R.	*Wabash.*
Wishard, Wm. H.	*Greenwood.*
Woodburn, J. H.	*Indianapolis.*
Woodworth, B. S.	*Fort Wayne.*
Wright, J. J.	*Monrovia.*

ILLINOIS.

Allen, George T.	*Marine.*
Amerman, George K.	*Chicago.*
Andrews, E.	*do.*
Bailey, F. K.	*Joliet, Will Co.*
Baldwin, S. G.	*Decatur.*
Bane, Wm. M.	*Payson.*
Banks, E. C.	*Charleston.*
Bartlett, John	*Chicago.*
Bassett, M. F.	*Quincy.*
Bevan, Thomas	*Chicago.*
Blaney, J. V. Z.	*do.*
Bloodgood, James	*do.*
Brainard, Daniel	*do.*
Brengle, Daniel D.	*Winchester.*

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Bridges, V. R.	*Salisbury.*
Brooks, Jonathan W.	*Chicago.*
Brown, H. B.	*Rockford.*
Brown, J. A.	*Kankakee.*
Bunce, James	*Galesburg.*
Byford, W. H.	*Chicago.*
Chamberlain, W. O.	*Princeton.*
Cheeny, L. P.	*Chicago.*
Clark, C. M.	*Galva.*
Clark, Charles W.	*Rockford.*
Clark, Lucius	*do.*
Colburn, E. M.	*Peoria.*
Coolidge, Charles	*Warsaw.*
Coopins, P. G.	*Fairweather.*
Crane, A. J.	*Decatur.*
Crist, D. L.	*Bloomington.*
Crothers, E. K.	*do.*
Crouse, D. F.	*Mount Carroll.*
Curtis, J. B.	*Decatur.*
Davis, N. S.	*Chicago.*
Davis, Wm. H.	*La Salle.*
De Witt, M. F.	*White Hall.*
Dickinson, Edward	*Peoria.*
Dodge, David	*Chicago.*
Duffield, E. G.	*Woodstock.*
Durham, Henry	*La Salle.*
Earle, Silas	*Onargo.*
Edgar, W. S.	*Jacksonville.*
Edmiston, T. K.	*Clinton.*
Edwards, Willis G.	*Alton.*
Evans, John	*Chicago.*
†Everett, S. W.	*Quincy.*
Fisher, Alexander	*Chicago.*
Fisher, T. D.	*Le Roy.*
Fitch, T. D.	*Kewanee.*
Foote, D. E.	*Belvidere.*
Fox, G. M.	*Lyons, Cook Co.*
Fox, W. R.	*Wilmington.*
Freer, J. W.	*Chicago.*
Frye, Joseph C.	*Peoria.*
Gardner, E. C.	*Vermont.*

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Golleday, H. P.	*Lacon.*
Goodbrake, C.	*Clinton.*
Gorham, Charles	*York.*
Graham, J. N.	*Chicago.*
Gregg, P.	*Rock Island.*
Hall, Geo. W.	*Carthage.*
Haller, F. B.	*Vandalia.*
Hamill, R. C.	*Chicago.*
Hamilton, Wm. R.	*Peoria.*
Hard, A.	*Aurora.*
Hard, C.	*Ottawa.*
Harriman, H. C.	*Jerseyville.*
Harrington, W. C.	*Payson.*
Hatch, Ira	*Chicago.*
Haven, S. R.	*do.*
Hay, Walter	*do.*
Heydock, M. O.	*do.*
Herrick, Josiah B.	*Vandalia.*
†Herrick, W. B.	*Chicago.*
Hewins, L. T.	*Loda.*
Hillis, Wm. A.	*Hillsboro'.*
Hinsey, Jos. C.	*Pekin.*
Hitchcock, Horatio	*Chicago.*
Hobbs, J. C. H.	*Galena.*
Hollester, J. H.	*Chicago.*
Holmes, E. L.	*do.*
Hume, S. T.	*Genesee.*
Hurd, H. S.	*Galesbury.*
Hurlbut, H. N.	*Chicago.*
Hurlbut, V. L.	*do.*
Isham, R. N.	*do.*
Johnson, C.	*York.*
Johnson, H. A.	*Chicago.*
Johnson, H. H.	*do.*
Johnson, M. J.	*Wilmington.*
Jones, H. Webster	*Chicago.*
King, Joseph	*Decatur.*
Kirwan, P.	*Ottawa.*
Knox, Wm. A.	*Rock Island.*
Lake, J. J.	*De Witt.*
Lardner, E. C.	*Vermont.*

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Lattimer, C. C.	*Princeton.*
Lewis, B. S.	*De Witt.*
†Long, S.	*Springfield.*
Luce, A. H.	*Bloomington.*
Madden, Z. H.	*Clinton.*
Maus, Jos. S.	*Perkin.*
Maus, W. S.	*do.*
McAllister, J.	*Chicago.*
McArthur, A. L.	*Joliet.*
McCord, D. O.	*York.*
McVey, Richard E.	*Waverly.*
Miller, De Laskie	*Chicago.*
Nance, Hiram	*Kewanee.*
Nichols, Adams	*Quincy.*
Noble, H.	*Heyworth.*
Noble, S. W.	*Bloomington.*
Paddock, S. A.	*Princeton.*
Page, J. L.	*Chicago.*
Palmer, A. B.	*do.*
Paoli, Gerhard	*do.*
Parker, Henry	*do.*
Parker, M.	*do.*
Parks, C. R.	*Bloomington.*
Pashley, Jno. S.	*Osceola.*
Paterson, Neils P.	*Chicago.*
Perry, Joseph	*Crete.*
Pierson, Daniel	*Augusta.*
Porter, John B.	*U. S. Army.*
Prince, David	*Jacksonville.*
Quigley, W. C.	*Chicago.*
Ralston, J. N.	*Quincy.*
Rankin, C. D.	*Peoria.*
Rea, R. L.	*Chicago.*
Robbins, H. C.	*Newark.*
Robbins, Joseph	*Quincy.*
Robinson, W.	*Dover.*
Rogers, T. P.	*Bloomington.*
Ross, J. P.	*Chicago.*
Rouse, Rudolphus	*Peoria.*
Samuel, J. B.	*Carrollton.*
Secord, Van Courtland	*Galva.*

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Sedgwick, W. W.	*Sandwich.*
Shepherd, M.	*Payson, Adams Co.*
Shumway, C. W.	*Chicago.*
Skelling, David	*Winchester.*
Smith, Charles G.	*Chicago.*
Smith, H. M.	*Vincennes.*
Smith, Orrin	*Chicago.*
Spitler, A.	*Carthage.*
Stahl, Adam	*Quincy.*
†Steele, E. A.	*Marshall.*
Steele, James M.	*Grandview.*
Stewart, A. E.	*Bloomington.*
Stipp, George W.	*do.*
Stout, Joseph	*Ottawa.*
Ten Brook, John	*Paris.*
Terry, A. R.	*Joliet.*
Thomas, Granville S.	*do.*
Thompson, Samuel	*Albion, Edwards Co.*
Tibbetts, L. P.	*Cottage Hill.*
Trowbridge, S. T.	*Decatur.*
Truesdell, Cilvin	*Rock Island.*
Tucker, D. M.	*Chicago.*
Varien, Wm.	*do.*
Wanzer, Hiram	*do.*
Warner, L. F.	*do.*
Washburn, Thomas D.	*Lawrenceville.*
Welch, Wm. W.	*La Salle.*
Whitcomb, C. W.	*Chicago.*
White, Chas.	*do.*
White, F. W.	*do.*
Wickersham, S.	*do.*
Wilkins, T.	*Vandalia.*
Williams, Hezekiah	*Alton.*
Wing, Henry	*Chicago.*
Wood, Wm.	*Cairo.*
Worrell, T. F.	*Bloomington.*
Wright, N.	*Chatham.*
Young, D. W.	*Aurora.*

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Adreon, Stephen W.	*St. Louis.*
Alexander, John B.	*Lexington.*
Allen, J. M.	*Prospect Hill.*
Alleyne, J. S. B.	*St. Louis.*
Atkinson, J. F.	*Lexington.*
Barnes, Jno.	*St. Louis.*
Barret, R. T.	*do.*
Baumgarten, Fred. E.	*do.*
Chandler, Chas. Quarles	*Rockfort.*
Clarke, R.	*St. Louis.*
Coons, A. J.	*do.*
Cooper, D. M.	*do.*
Currie, Wm. A.	*Jefferson City.*
Engleman, George	*St. Louis.*
Frazer, E. S.	*do.*
Golden, Walter S.	*do.*
Hartt, Geo. C.	*Boonville.*
Hempstead, C. W.	*St. Louis.*
Holmes, R. S.	*do.*
Johnson, George	*do.*
Johnson, John B.	*do.*
Johnson, Richard P.	*do.*
Knode, Oliver B.	*St. Joseph.*
Lemoine, E. S.	*St. Louis.*
Lewis, R. K.	*Huntsville.*
Linten, M. L.	*St. Louis.*
Magoffin, John	*do.*
Massie, T. E.	*do.*
McDowell, Joseph N.	*do.*
McMurray, Jno. H.	*Independence.*
McPheeters, Wm. M.	*St. Louis.*
Meade, D. E.	*do.*
Mendenhall, T. J.	*Palmyra.*
Moore, J. S.	*St. Louis.*
Moses, S. Gratz.	*do.*
Penn, George	*Fee-fee.*
Perry, L. P.	*St. Louis.*
Phillips, Geo. W.	*do.*

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Pollak, S.	*St. Louis.*
Pope, Charles A.	*do.*
†Reyburn, Thomas	*do.*
Reynolds, J. W.	*Fort William.*
Riley, A. A.	*Fulton.*
Ritchie, S.	*Liberty.*
Schoeneich, H.	*St. Louis.*
Scott, J. W.	*do.*
Shoemacher, Hammond	*Milwood.*
Smith, E. F.	*St. Louis.*
Smith, J. D.	*Fayette.*
Stevens, C. W.	*St. Louis.*
Swallow, G. C.	*Columbia.*
Tandy, D. C.	*St. Louis.*
Vaughn, Isaac P.	*Glasgow.*
Walker, George S.	*St. Louis.*
Washington, James R.	*do.*
Watters, Jno. H.	*do.*
Welburn, John C.	*Frankford.*
Wilson, J. W.	*St. Louis.*
Wislizénus, Adolphus	*do.*
Woodson, John C.	*Spencerburg.*

ARKANSAS.

Armstrong, F. W.	*Pine Bluff.*
McGavoch, F. Grundy	*Pecan-Point.*

MICHIGAN.

Allen, J. A.	*Ann Arbor.*
Andrews, J.	*Pawpaw.*
Armor, S. G.	*Ann Arbor.*
Arnold, S. R.	*Monro.*
Axford, S. M.	*Flint.*
Barnum, B.	*Schoolcraft.*
Beech, J. H.	*Coldwater.*
Bennett, J.	*Centreville.*
Brodie, Wm.	*Detroit.*
Brown, J. A.	*do.*
Carpenter, H.	*Hancock.*

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Christian, E. P.	*Detroit.*
Clapp, H. C.	*Pawpaw.*
Cobb, H. P.	*Detroit.*
Cobb, L. H.	*do.*
Cone, E. D.	*Hillsdale.*
Cox, Edward	*Battle Creek.*
Davenport, Lewis	*Detroit.*
Denton, S.	*Ann Arbor.*
Douglass, S. H.	*do.*
Durton, Samuel	*do.*
Egery, Edward A.	*Three Rivers, St. Joseph Co.*
Fanner, C. P.	*Ann Arbor.*
Ford, Corydon L.	*do.*
French, S. B.	*Battle Creek.*
Gorton, J. C.	*Detroit.*
Greene, M. L.	*Pontiac.*
Gunn, Moses	*Detroit.*
Haze, W. H.	*Farmington.*
Hitchcock, Homer O.	*Kalamazoo.*
Inglis, R.	*Detroit.*
Jenks, Edward W.	*do.*
Johnson, G. K.	*Pontiac.*
Kibbie, J.	*Port Huron.*
Kinney, M. C.	*Lapeer.*
Klein, P.	*Detroit.*
Leach, E.	*Owassa.*
Leasia, J. A.	*Williamston.*
Leete, Albert E.	*Romeo.*
†Leland, A. L.	*Detroit.*
McCollom, C.	*Romeo.*
Murray, Andrew	*Niles.*
Nims, Dwight	*Homer.*
Paddack, J.	*Pontiac.*
Palmer, A. B.	*Ann Arbor.*
Patterson, M. A.	*Tecumseh.*
Pierce, James L.	*Corunna.*
Pitcher, Zina	*Detroit.*
Platt, A.	*Grand Rapids.*
Potter, A. O.	*Ann Arbor.*
Rice, R. S.	*Detroit.*
Richardson, S. D.	*Three Rivers, St. Joseph Co.*

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Russell, Geo. B.	*do.*
Sager, A.	*Ann Arbor.*
Seely, T. P.	*do.*
Shepard, Charles	*Grand Rapids.*
Smith, J. S.	*Armada.*
Stebbins, N. D.	*Detroit.*
Stewart, Morse	*do.*
Stockwell, Cyrus M.	*Port Huron.*
Stone, A. R.	*Almonte.*
Storm, A. R.	*do.*
Tanner, C. P.	*Ann Arbor.*
Taylor, Hen.	*Mount Clemens.*
Tillson, Philo	*Romeo.*
Tompkins, L. D.	*Cassapolis.*
Van Deusen, E. H.	*Kalamazoo.*
Wells, B. P.	*Niles.*
Wells, E.	*Ann Arbor.*
White, John B.	*Saginaw.*

IOWA.

Adler, John	*Davenport.*
Allen, J. R.	*Keokuk.*
Arnold, Edward A.	*Davenport.*
Baker, John W. H.	*do.*
Barrows, Egbert S.	*do.*
Carpenter, Horace	*Blue Grass.*
Cary, L. H.	*Toledo.*
Edwards, T. O.	*Dubuque.*
Elbert, Jno. D.	*Keosaqua, Van Buren Co.*
Ely, Jno. F.	*Cedar Rapids.*
Ford, E. R.	*Keokuk.*
†Fountain, E.	*Davenport.*
Francis, E. C.	*Keokuk.*
Hamilton, Horace	*National.*
Horr, Asa	*Dubuque.*
Hughes, J. C.	*Keokuk.*
Iles, Thomas	*Davenport.*
Lay, Sam. C.	*Dubuque.*

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Lyons, W. B.	*Huntington.*
Malcolm, A. B.	*Dubuque.*
McCurdy, A. T.	*Keokuk.*
†McGugin, D. L.	*do.*
Meeker, Daniel	*do.*
Peck, W. F.	*Davenport.*
Rauch, J. H.	*Burlington.*
Sanborn, J. E.	*Keokuk.*
Sandford, John F.	*do.*
Siveter, Thomas	*Salem.*
Sprague, Joseph	*Dubuque.*
Taylor, M. K.	*Keokuk.*
Tomson, J. J.	*Davenport.*
Van Patten, N.	*do.*
Watson, Wm.	*Dubuque.*
White, J. W.	*Stockport.*
Witherwax, J. M.	*Davenport.*

WISCONSIN.

Adams, Homer	*Janesville.*
Ayres, D. Cooper	*Green Bay.*
Bartlett, John K.	*Milwaukee.*
Bicknell, S. W.	*Beloit.*
Brisbane, W. Henry	*Arena.*
Brown, J. J.	*Madison.*
Carr, Ezra S.	*do.*
Castleman, A. L.	*Delafield.*
Chapman, C. B.	*Madison.*
Douseman, John B.	*Milwaukee.*
McKinley, Hays	*Kenosha.*
Meachem, John G.	*Racine.*
Pease, C. G.	*Janesville.*
Stoddard, Charles L.	*East Troy.*
Thorn, Samuel S.	*Milwaukee.*
Van Duzen, Harmon	*Mineral Point.*
Wells, Wm. L.	*Milwaukee.*
Wilbur, George	*Mineral Point.*

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Ford, John D.	*Winona.*
Hand, D. W.	*St. Paul.*
Le Boutillier, C. W.	*St. Anthony.*
Murphy, John	*do.*
Potts, Thomas R.	*St. Paul.*

CALIFORNIA.

Harvey, O.	*Placerville.*
Little, William B.	*San Francisco.*
Logan, Thomas M.	*Sacramento.*

KANSAS.

Logan, C. A.	*Leavenworth.*
Stormont, D. W.	*Topeka.*
Tinks, Tiffin	*Leavenworth.*

DACOTAH TERRITORY.

Jayne, Wm.	*Yankton.*

CHEROKEE NATION.

Ross, R. D.	*Grand Sabine.*

UNITED STATES ARMY.

Blake, Eli Whitney	Porter, J. B.
Clements, B. A.	Smith, Gouverneur M.
Cuyler, J. M.	Taylor, M. K.
Jarvis, N. S.	Teats, Sylvester
McLaren, A. N.	Tripler, Chas. S.
Moses, Israel	Wirtz, Horace Ralph
Mott, Alex. B.	Wood, R. C.
Otis, George A.	Woodward, J. J.

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Bache, B. F.
†Barrington, Samuel
Beale, Joseph
Clymer, Geo.
Delany, M. G.
Eversfield, Charles
Horner, G. R. B.
Jackson, S.
Lockwood, John
Maxwell, C. D.
Shippen, Edward
Smith, Thomas L.
Taylor, J. Winthrop
Wood, W. Maxwell

FOREIGN.

W. F. Atlee,
W. H. Berry,
R. R. McIlvaine,
N. J. Pittman,

Delegates from the *American Medical Society in Paris.*

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INDEX.

Abortion, prize essay on, 711
Address of President N. S. Davis, 71
Allen, Dr. Hiram, biographical notice of, 617
Allen, Dr. W. H., biographical notice of, 609

Bell, Dr. A. N., on introduction of disease by commerce, 333
Biographical notice of—
W. H. Allen, 609
Geo. Hayward, 610
Jno. C. Dalton, 610
Jno. C. Ware, 611
W. E. Coale, 612
L. Bartlett, 613
J. J. Smith, 614
Ezekiel Fowler, 616
Hiram Allen, 617
Jonathan Knight, 619
Benjamin Silliman, 623
A. G. Benedict, 625
R. G. Frary, 625
Arba Blair, 626
M. G. Porter, 627
Franklin Evarts, 627
Jos. Martin, 628
Valentine Mott, 628
J. Augustine Smith, 630
Jephtha B. Munn, 630
Jno. B. Johns, 631
Jno. C. Elmer, 631
Jno. S. Darcy, 631
Silas L. Condict, 632
Wm. M. Brown, 632
J. T. B. Skillman, 632
J. Addison Freeman, 633
W. H. Gillingham, 634
Franklin Bache, 635
A. Bournonville, 637
Jos. H. Haskell, 640
J. M. Pugh, 640
Jno. Redman Coxe, 642
Samuel Chew, 643
Jno. P. Mackenzie, 644
Jno. W. Moss, 644
Jos. Thoburn, 645
Sam. Long, 647
Peter Walker, 648
Biographical notice of—
Geo. Reeder, 649
Amos Witter, 650
Surgeons U. S. Army, 651

Catlin, Dr. B. H., climatology of Conn., 469
Chew, Dr. Samuel, biographical notice of, 643
Chronic inflammation of joints, 379
Clavicle, dislocation of, 411
Climatology of Connecticut, 469
California, 497
Coale, Dr. W. E., biographical notice of, 612
Code of ethics, 765
Compulsory vaccination, 265, 307
Condict, Dr. S. L., biographical notice of, 632
Connecticut, necrology of, 618
Cox, Dr. C. C., report on Amer. Med. Necrology, 609
Coxe, Dr. Jno. Redman, biographical notice of, 642

Dalton, Dr. Jno. C., biographical notice of, 610
Darcy, Dr. Jno. S., biographical notice of, 631
Davis, Dr. N. S., address of, 71
Doctrine of sensitive and motor nerves, 455

Ear, foreign bodies in, 431
Elmer, Dr. J. C., biographical notice of, 631
Elsberg, Dr. L., prize essay on morbid growths in larynx, 655
Evarts, Dr. Franklin, biographical notice of, 627
Exsection of wrist-joint, 405

Fisher, Dr. A., on sulphites of lime and soda, 95
Fissure of the soft and hard palate, 353
Foreign bodies in the ear, 431
Fowler, Dr. E., biographical notice of, 616

Digitized by Google

Frary, Dr. R. G., biographical notice of, 625
Freeman, Dr. J. A., biographical notice of, 633

Gillingham, Dr. W. H., biographical notice of, 634

Haskell, Dr. Benj., on sensitive and motor nerves, 455
Haskell, Dr. J. H., biographical notice of, 640
Hayward, Dr. Geo., biographical notice of, 610
Holton, Dr. H. D., on dislocation of clavicle, 411

Illinois, necrology of, 647
Insanity, report on, 123
Introduction of disease by commerce, 333
Iowa, necrology of, 648

Johns, Dr. Jno. B., biographical notice of, 631
Joint, exsection of wrist, 405
Joints, mechanical treatment of chronic inflammation of, 379

Knight, Dr. J., biographical notice of, 619

Larynx, morbid growths in, 655
Long, Dr. Saml., biographical notice of, 647
Logan, Thos. M., on climatology, &c., of California, 497

Mackenzie, Dr. John P., biographical notice of, 644
Maine, necrology of, 609
Martin, Dr. Joseph, biographical notice of, 628
Maryland, necrology of, 643
Massachusetts, necrology of, 610
Mechanical treatment of chronic inflammation of joints, 379
Minutes of sixteenth annual meeting, 9
address of Dr. Bigelow, 9
delegates present, 12
invited guests, 28
reports of committees, 29
voluntary communications, 33
committee on nominations, 34
resolutions on M. A. Pallen, 35
case referred to committee on ethics, 35
resolutions on Dr. V. Mott, 36
appointment of committee on ethics, 36
resolutions on medical rank in army, 36
resolutions on medical rank in navy, 37
action on report of committee of publication, 37
Minutes of sixteenth annual meeting—
resolutions for guidance of sections, 37
communication from Gov. Andrew, 37
report of committee on prize essays, 38
resolution on vols. of *Transactions* for Permanent Secretary, 39
permanent members elected, 39
amendment to Constitution offered by Dr. Toner, 39
report on revision of plan of organization, 39
selection of place of meeting, 40
committee on Dr. S. D. Willard, 40
resolutions for guidance of sections, 40
resolutions on list of officers, 41
discretionary power granted to committee of publication, 41
section on psychology added, 41
section on anatomy and physiology changed, 41
resolution on delegates to Association of insane asylums, 41
amendment to Constitution offered by Dr. Mayburry, 41
amendment to Constitution offered by Dr. Bissel, 42
officers for 1866, 42
committees for 1866, 43
committee on medical ethics on Dr. Reynolds, 44
candidates for permanent membership rejected, 44
amendment to Constitution offered by Dr. Toner, 44
resolutions of Drs. Knight, Silliman, and Hooker, 45
New York resolutions on advertising, 45
report of the committee on specialists, 47
reports of sections, 47
report on microscope referred to a committee, 48
international medical ethics, 48
remarks of Dr. Marsden, 49
protest on case of M. A. Pallen, 50
committee on reply, 51
communication from Dr. Mussey, 51
explanation of Dr. Woodward, 52
election of permanent members, 52
address of Gov. Andrew, 52
reply of committee to protest, 54
amendment to Constitution offered by Dr. Twitchell, 56
resolution on Hunter prize fund, 56
resolutions of thanks, &c., 56
postponement of amendments to Constitution offered last year, 58

Digitized by Google

Minutes of sixteenth annual meeting—
remarks of Dr. Childs, 59
remarks of President, 59
Morbid growths in larynx, 655
Moss, Dr. John W., biographical notice of, 644
Mott, Dr. Valentine, biographical notice of, 628
Munn, Dr. J. B., biographical notice of, 630

Nebinger, Dr. A., on smallpox, 281
New Jersey, necrology of, 630
New York, necrology of, 625

Officers, 781
Ophthalmology, practical observations in, 417
Ordinances, 761

Pennsylvania, necrology of, 634
Permanent members, 787
Porter, Dr. M. G., biographical notice of, 627
Prize essay, L. Elsberg, 655
H. R. Storer, 711
Pugh, Dr. John M., biographical notice of, 640

Reeder, Dr. Geo., biographical notice of, 649
Report of committee of publication, 63
of treasurer, 65
of section on practical medicine and obstetrics, 89
on sulphites of lime and soda, 95
of committee on insanity, 123
of section on medical jurisprudence and hygiene, 259
of committee on vaccination and re-vaccination, 265
of committee on introduction of disease by commerce, 333
of section on surgery, 347
of section on meteorology, medical topography and epidemics, 465
on climatology, &c., of Connecticut, 469
on climatology, &c., of California, 497
Report—
of committee on medical rank in army, 573
of committee on medical rank in navy, 583
of committee on medical education, 587
of committee on American medical necrology, 609
of committee to revise plan of organization, 749
Rhode Island, necrology of, 614

Sayre, Dr. L. A., on mechanical treatment of chronic inflammation of joints, 379
Silliman, Dr. Benjamin, biographical notice of, 623
Skillman, Dr. J. T. B., biographical notice of, 632
Smallpox, Dr. A. Nebinger on, 281
Smith, Dr. J. A., biographical notice of, 630.
Smith, Dr. J. J., biographical notice of, 614
Storer, Dr. H. R., on insanity, 123
forced abortions, 711
Sulphites of lime and soda, use of, 95

Tewksbury, Dr. S. H., on exsection of wrist-joint, 405
Thoburn, Dr. Joseph, biographical notice of, 645
Toner, Dr. J. M., on compulsory vaccination, 307
Turnbull, Dr. L. on foreign bodies in ear, 431

United States Army, necrology of, 651

Walker, Dr. P., biographical notice of, 648
Ware, Dr. J. C., biographical notice of, 611
West Virginia, necrology of, 644
Williams, Dr. E., practical observations on ophthalmology, 417
Witter, Dr. A., biographical notice of, 650

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